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Ontario Geological Survey
Open File Report 6129

Report of Activities, 2003 Resident Geologist Program

Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District

2004

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ONTARIO GEOLOGICAL SURVEY

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Report of Activities, 2003
Resident Geologist Program

Thunder Bay South Regional Resident Geologist Report:
Thunder Bay South District

by

B.R. Schnieders, J.F. Scott, M.S. O'Brien, M.A. Magee and C. Komar

2004

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Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Thunder Bay South Regional Resident Geologist (Thunder Bay South District)—2003

by

B.R. Schnieders, J.F. Scott, M.S. O'Brien, M.A. Magee and C. Komar

2004

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Thunder Bay South Regional Resident Geologist (Thunder Bay South District)–2003

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INTRODUCTION

The Thunder Bay South District covers an area from Calm Lake, west of Atikokan, east to White River, and north to Armstrong from the United States border. The District Program is based in Thunder Bay, but also maintains a seasonal field office in Marathon.

The authors note that for ease of reading, the name of the reporting company has been omitted when referencing news releases, unless more than one company has been mentioned in the preceding text. All Universal Transverse Mercator (UTM) co-ordinates are reported in North American Datum 1927 (NAD27).

MINING ACTIVITY

There were 4 producing precious and base metal mines, as well as several amethyst producers and an agate mine in the Thunder Bay South District in 2003. Mine production and reserves are listed in Table 1. Work completed within the Thunder Bay South District and filed for assessment credits is shown in Table 2. Exploration activity in the Thunder Bay South District is listed in Table 3.

Table 1. Mine production and reserves in the Thunder Bay South Resident Geologist's District in 2003.

Mine	Production to end of 2002		Production in 2003		Reserves at end of 2003	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
David Bell Mine	7 523 059 t @ 13.5 g/t Au	3 266 029 ounces Au	379 243 t @ 10.15 g/t Au	123 757 ounces Au	2 381 960 t	10.06 g/t Au
Golden Giant Mine	17 584 384 t @ 10.99 g/t Au	6 214 791 ounces Au	663 225 t @ 11.76 g/t Au	247 010 ounces Au	1 016 000 t	10.1 g/t Au
Lac des Iles Mine	12 802 172 t	848 597 ounces Pd 63 266 ounces Pt 58 103 ounces Au 16 434 649 pounds Cu 10 528 999 pounds Ni	5 159 730 t @ 2.31 g/t Pd	288 703 ounces Pd 23 742 ounces Pt 23 536 ounces Au 7 142 674 pounds Cu 4 070 785 pounds Ni	39 012 000 t (Open Pit reserves as of June 30, 2003) 4 978 000 t (Underground reserves as of June 30, 2003)	1.89 g/t Pd 5.88 g/t Pd
Williams Mine	38 043 404 t @ 5.95 g/t Au	7 271 815 ounces Au	3 196 822 t @ 4.28 g/t Au	440 357 ounces Au	29 500 000 t	2.87 g/t Au

Amethyst

Two areas northeast of Thunder Bay are well-known locations for amethyst veins and production. In the area along the Magone Lake Road, north of MacGregor Township (accessible via Highway 527), 5 sites see periodic, small-scale extraction of amethyst. In McTavish Township, 8 deposits are accessible from Highways 11 and 17, 4 of which operate as seasonal tourist attractions. The Blueberry Amethyst Patch also operates as a seasonal tourist attraction, southwest of Kakabeka Falls. Local amethyst deposits and mines are listed below:

Deposit / Mine	Location	Owner(s)
Amethyst Mine Panorama	McTavish Township	S. and T. Lukinuk
Ancliff Station Amethyst Quarry	McTavish Township	C. Anderson
Bak Quarry	McTavish Township	D. Bak
Blueberry Amethyst Patch	Marks Township	J. Hakala and S. Bellettini
Blue Points Amethyst Mine	McTavish Township	L. Swanson
Boulder Creek Amethyst	North of MacGregor Township	C. Anderson
Breezy Mountain Amethyst Mine	McTavish Township	T. Twomey
Crystal Creek Amethyst Mine	North of MacGregor Township	R. Hietapakka
DanBill Amethyst Mines	McTavish Township and North of MacGregor Township	B. Richardson and D. Arsenault
Diamond Willow Amethyst Mine	McTavish Township	D. Noyes
Gem Mountain Amethyst Mine	North of MacGregor Township	O. and R. Harty
Keetch Amethyst Quarry	McTavish Township	N. Keetch
Ontario Gem Amethyst Mine	McTavish Township	P. Marino
Purple Haze Mine	North of MacGregor Township	M. and S. Grieve
Thibault Amethyst Quarry	North of MacGregor Township	D. Thibault

Gold

The 3 Hemlo mines (David Bell, Golden Giant and Williams mines) continue to produce gold from the Hemlo deposit.

DAVID BELL MINE (TECK–CORONA OPERATING CORPORATION)

Production from the David Bell Mine (Teck Cominco Limited (50%) – Barrick Gold Corporation (50%)), from January 1, 2003 to December 31, 2003, consisted of 123 757 ounces of gold from 379 243 t milled at a feed grade of 10.15 g/t gold (T. Madill, Teck–Corona Operating Corporation, personal communication, 2004).

As of January 1, 2004, proven and probable reserves from the 'A', 'C' and 'D' zones totalled 2 381 960 t at a grade of 10.06 g/t gold, containing 770 374 ounces of gold (ibid.).

GOLDEN GIANT MINE (NEWMONT CANADA LIMITED)

Production from the Golden Giant Mine in 2003 totalled 663 225 t milled at an average grade of 11.76 g/t gold (247 010 contained ounces of gold) and a recovery rate of 96.18% (H. Lockwood, Newmont Canada Limited, personal communication, 2004).

As of January 1, 2004, proven and probable reserves for the Golden Giant Mine totalled 1 016 000 t at a grade of 10.1 g/t gold (331 000 total contained ounces gold) (ibid.). The Golden Giant Mine will produce until the end of 2006.

WILLIAMS MINE (WILLIAMS OPERATING CORPORATION)

Production from the Williams Mine (Teck Cominco Limited (50%) – Barrick Gold Corporation (50%)) in 2003 totalled 3 196 822 t milled at an average grade of 4.28 g/t gold (440 357 contained ounces of gold) (T. Madill, Williams Operating Corporation, personal communication, 2004).

As of January 1, 2004, underground and open-pit reserves for the Williams Mine totalled 29.5 M t at a grade of 2.87 g/t gold (2 700 000 total contained ounces gold) (ibid.). The Williams Mine is actively exploring to delineate the total resource on the mine property (G. Skrecky, Williams Mine, personal communication, 2004). The Williams Mine is planning a proposed expansion of their open-pit operations, which would make the mine economically viable for the next 11 years (*Chronicle Journal*, November 7, 2002).

Platinum Group Elements

LAC DES ILES MINE (LAC DES ILES MINES LTD.)

In 2003, the Lac des Iles Mine of **North American Palladium Ltd.** processed 5 159 730 tonnes of ore or 14 136 tonnes per day with a head grade of 2.31 g/t palladium, producing 288 703 ounces palladium, 23 742 ounces platinum, 23 536 ounces gold, 7 142 674 pounds copper and 4 070 785 pounds nickel (press release, January 6, 2004).

Proven and probable reserves for the open pit are 39 million tonnes grading 1.89 g/t palladium and underground probable reserves are 4.98 million tonnes of 5.88 g/t palladium (press release, August 22, 2003). An underground pre-feasibility study and a magnetotelluric geophysical survey have been completed on the mine property (M.J. Lavigne, Lac des Iles Mines Ltd., personal communication, 2003).

EXPLORATION ACTIVITY

Mining Lands

In the Thunder Bay South District, there were 5893 claim units staked, 10 647 claim units cancelled and a total of 22 232 active claims units as of December 31, 2003.

Gold Exploration

Freewest Resources Canada Inc. acquired the Larose property (*see* "Property Visits") in the Shebandowan greenstone belt. R. Kwitakowski and Freewest prospectors made new high-grade gold discoveries. Stripping and prospecting have exposed *en échelon* shear zones over a strike length of 1500 m. Grab samples up to 10.85 ounces per ton gold have been reported and the average assay yielded 27.7 g/t gold (0.81 ounce per ton). Soil sampling, geological mapping, magnetic and induced polarization (IP) geophysical surveys, stripping, sampling and diamond drilling were conducted in 2003. The J&R, Larose, P, Snoopy, Porphyry and Northwest View occurrences extend over 1500 m and will be targeted in a first-phase diamond drilling program (*Canada Stockwatch*, November 12, 2003). A strong IP anomaly is coincident with the Main zone over a minimum 1500 m strike length (*Canada Stockwatch*, December 9, 2003).

Pele Mountain Resources Inc. is diamond drilling the Ardeen Mine property, one of Ontario's oldest gold mines. A new gold zone, called the Pele zone, has been identified by geophysical surveys and surface sampling (*The Northern Miner*, February 10–16, 2003). Hole #1 intersected 3.75 g/t gold over 0.6 m, while Hole #2 stopped in a vein, which assayed 10.31 g/t gold and 32.0 g/t silver over 0.3 m. The Pele zone is described as a quartz vein or a series of closely spaced quartz stringers hosted within a gold-bearing strain zone up to 10 m wide that is intruded by quartz feldspar porphyry dikes, which have been altered and mineralized (*Canada Stockwatch*, March 11, 2003).

Canadian Golden Dragon Resources Ltd. discovered new gold zones, and extended a base metal-mineralized, chert-exhalative horizon 400 m to the west on the Vanguard project, near Shebandowan. Grab samples assayed up to 16.5 g/t gold from quartz-pyrite veins that cut a carbonatized magnetic zone, which parallels the chert horizon. Canadian Golden Dragon stripped 5 areas adjacent to the Vanguard chert-exhalative horizon. The mineralized zone was followed for 250 m and grab samples of 16.5, 11.0 and 5.1 g/t gold were reported. Quartz veins cut the chert exhalite and a flow-top breccia; the chert exhalite is interpreted to be the same unit extending 13 km to the North Coldstream Mine. Five new base metal targets have been selected for diamond drilling, including the down-plunge extension of a chalcopyrite-bearing chert unit adjacent to the new gold zone (*Canada Stockwatch*, December 9, 2003). Diamond drilling on the West Vanguard assayed up to 2.33% copper and 4.26% zinc, and a 6.6 m drill intersection on the East Vanguard (Hole VE-02-2) averaged 2.14 g/t gold, 43.4 g/t silver, 2.73% copper and 3.49% zinc. Further exploration is ongoing (press release, September 25, 2003).

East West Resource Corporation and **Maple Minerals Corp.** have staked the Obadinaw gold property northeast of the Larose property of Freewest Resources Canada Inc. The 234-claim property covers an 8 km extension of sheared and altered metasedimentary rocks, as well as felsic intrusive rocks (press release, November 6, 2003).

Maple Minerals Corp. and **East West Resource Corporation** have discovered new gold showings in the Shebandowan greenstone belt. The companies are equal partners in the Hamlin, Shear, Powell and Clay properties, and clearcut logging has exposed a 100 m wide zone of disseminated pyrite, sericite and potassic alteration. Grab samples assayed up to 2.54 g/t gold from the Sericitic zone. Potential for shear hosted, porphyry style gold deposits are being explored at the Hamlin, Shear, Powell and Clay properties over a strike length of more than 14.5 km (press release, July 2, 2003).

Canadian Golden Dragon Resources Ltd. has optioned the Tilly Creek Cu-Au property in the West Shebandowan belt. Quartz veins and silica flooded shear zones in metasedimentary rocks assay up to 5.2% copper and 4.08 g/t gold. Stripping has exposed shearing and mineralization for up to 2 km, and a 2 m wide quartz vein assayed up to 7.13% copper, 1.11 g/t gold and 62 g/t silver. Induced polarization surveys are planned to identify sulphide concentrations, followed by diamond drilling (*Canada Stockwatch*, December 10, 2003).

The Smoke Lake project, northeast of Marathon, is being explored by **Freewest Resources Canada Inc.** Quartz veins, altered granodiorite, syenite and lamprophyre dikes host gold mineralization along north-northeasterly trending structures and along the contact of the Beggs Lake stock. Results in 2002 include the discovery of mineralized boulders (returning up to 312.9 g/t gold) and several bedrock showings including the Super G, Double Deuce, and Lucky 13, with grab sample assays up to 22.16 g/t gold. The Super G and Double Deuce occurrences were diamond drilled in 2003 and assay results are pending. Grab samples collected by the authors returned up to 47.7 ounces per ton gold from the Super G vein (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

ValGold Resources Ltd. conducted 2 phases of diamond drilling on the Tower Mountain project, west of Thunder Bay and intersected 5.40 g/t gold over a core length of 7.5 m. Included in this intersection was a higher grade section assaying 11.8 g/t gold over 3 m (*Canada Stockwatch*, March 27, 2003). A second structural direction (NNW), which may control mineralization, has been identified (press release, June 19, 2003). Additional stripping, trenching and sampling were conducted during the field season, and a second drill program intersected 5.40 g/t gold across 7.5 m from 78.5 to 86.0 m (including 11.77 g/t gold across 3 m from 81.5 to 84.5 m). Hole DDH-03-3 intersected 2.06 g/t gold across 7.5 m from 38 m to 45.5 m (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

North American Gem Inc. has located a new gold showing on its Crayfish property in the Shebandowan greenstone belt. Samples from a carbonate-sulphide bearing zone discovered by prospecting assayed up to 5.475 g/t gold. Recent staking has acquired additional ground associated with IP anomalies and adjacent to the gold zones. Previous drilling on the property has intersected 3% copper and 0.27% nickel; platinum group elements (PGE) were not assayed for. Grab samples on a newly discovered zone, located north of the Crayfish Creek fault, assayed up to 10.01 g/t palladium and 3.76 g/t platinum (*Canada Stockwatch*, June 19, 2003). Prospecting and channel sampling on the Peninsula zone returned channel samples of up to 3.38 g/t gold over 1 m and 1.09 g/t palladium over 1 m. Five new gold occurrences were also discovered, ranging from 559 ppb Au to over 11.5 g/t gold (*Canada Stockwatch*, November 11, 2003).

RJK Explorations Ltd. announced a new gold discovery on the Wedge property, west of Thunder Bay. Hole WGE-03-01 returned 5.89 g/t gold over 3.03 m. The mineralization is within a sulphide-facies, pyrite-graphitic horizon, which has been brecciated, deformed and altered (press release, April 3, 2003). Three zones of anomalous gold mineralization have been confirmed. The Wedge zone was tested by 4 diamond drill holes and returned a weighted average of 0.28 g/t gold across a true width of 9.5 m. The Creek zone, located 800 m southwest of the Wedge zone, has returned 2.27 g/t gold over a core length of 9.13 m, including 5.89 g/t gold over 3.03 m in Drill Hole WGE-03-01. A third zone, the South zone located approximately 650 m southwest of the Creek zone, returned 0.342 g/t gold over 10.75 m, including 0.73 g/t gold over 4 m. Seven holes, totalling 917.62 m, were drilled (*Canada Stockwatch*, December 22, 2003).

Moss Lake Gold Mines Ltd. made a new gold discovery on the Moss Lake property. Moss Lake completed a 5000-foot diamond drilling program, testing for pyritic-stratabound gold deposits. Drilling near Fountain Lake intersected pyritic, felsic tuffaceous rocks. Drill intersections of up to 6.9 g/t gold across 1.86 m were encountered in this unit. Induced polarization geophysical surveys have traced this mineralized horizon for more than 1.2 km. The company owns 100% of the Moss Lake deposit estimated by Noranda Exploration Company Ltd. in 1982 to host 60 million tonnes, grading 1.1 g/t gold or about 2.1 million ounces of gold above a depth of 250 m (press release, November 3, 2003).

J. & J. Hackl continue to prospect in the Laurie Township area, where new grab samples up to 2.01 ounces per ton gold have been discovered off the Moosecalf East property. The area has undergone intense carbonate alteration. The Moosecalf East and Dam properties have numerous showings related to Timiskaming sedimentary rocks, structure, carbonatization and silicification.

Staccato Gold Resources Ltd. has recently finished 1200 m of diamond drilling on the Shebandowan property (formerly Swamp River–Band Ore property). Drilling focussed on the Main zone, which Noranda Exploration Company Ltd. estimated in 1981 to contain approximately 600 000 tonnes of 4.83 g/t gold. The company recently completed magnetic, electromagnetic and induced polarization geophysical surveys, which provided targets for the drilling program (*Canada Stockwatch*, November 24, 2003).

Aavdex Corporation has optioned the Black Fly property located near Atikokan. A qualifying report is being prepared on the property (*Canada Stockwatch*, November 27, 2003).

Tri-Alpha Investments Ltd. conducted $110 000 worth of stripping and channel sampling in 10 trenches on the Big Duck Lake property north of Schreiber. Channel samples of up to 29.30 g/t gold over 1.5 m and 3.21 g/t gold over 4 m were reported. Induced polarization geophysical surveys and diamond drilling are planned for the property (press release, December 11, 2003).

Base Metal Exploration

Atikokan Resources Inc. has completed a program of channel sampling and percussion drilling on the Lumby Lake silver zone. The company has received a permit from MNDM to take a 1000-tonne bulk sample (press release, January 16, 2003). As of August, several hundred tonnes of high-grade silver ore had been stockpiled and Atikokan Resources was making arrangements for milling. A selected grab sample of the stockpiled ore collected by the senior author assayed 9597 ppm Ag (308.5 ounces per ton silver) and 2973 ppb Au. Pods or lenses of near massive sulphide, including sphalerite, galena and pyrite were also discovered while bulk sampling. Selected grab samples assayed up to 32.5% zinc, 12.5% lead and 40.0 ounces per ton silver (R. Bernatchez, Atikokan Resources Inc., personal communication, 2004). A 30 cm chip sample collected by the authors from the West Richardson Lake area, located 10 km east of the Lumby Lake area, returned 3.3% zinc and 9 g/t silver (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

Canadian Golden Dragon Resources Ltd. diamond drilled the Vanguard base metal property and intersected 9.75 m averaging 1.26 g/t gold, 13 g/t silver, 2.03% copper and 2.13% zinc in Hole VE02-1 and 6.6 m section assaying 2.14 g/t gold, 43.4 g/t silver, 2.73% copper and 3.49% zinc in Hole VE02-2 (*Canada Stockwatch*, January 15, 2003).

Noranda Inc. has optioned the Havoc Lake project and will explore for nickel-copper-PGE. The property is owned by East West Resource Corporation and Jubilee Platinum plc is a joint venture partner. Previous airborne EM surveys and drilling intersected picrite and pyroxenite; further drilling is planned. Coincident EM conductors and copper-zinc geochemical anomalies will be diamond drilled in November and December (press release, October 30, 2003).

Nickel-Copper-Platinum Group Element Exploration

Beep-mat prospecting by **G. and M. Gionet** has extended the **Moshkinabi** sulphide zone located near Manitouwadge. Stripping and trenching have exposed nearly massive sulphide mineralization for more than 100 m along strike, hosted by a deformed mafic to ultramafic intrusive complex. Grab samples have assayed as high as 14.15% copper, 0.91% nickel, 3.04 g/t palladium, 0.54 g/t platinum and 0.20 g/t gold. Options are pending; the property has never been diamond drilled. A grab sample submitted by the authors assayed 15.33% copper, 3.29 g/t palladium, and 0.38 g/t platinum (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

Platinum Group Metals Ltd. (PTM) diamond drilled its Lac des Iles project, including the Stinger and Vande zones. At the Stinger zone, drilling intersected 1.23 g/t palladium+platinum+gold (Pd+Pt+Au) across 5.6 m, while at the Vande occurrence, 2 m of 1.38 g/t palladium, 0.54 g/t platinum and 0.03 g/t gold were intersected during drilling (*The Northern Miner*, March 31–April 6, 2003). A second 2800 m diamond drill program in joint venture with Maple Minerals Corp. and East West Resources Ltd. was initiated in the late fall of 2003. Drilling tested the on strike and down dip extension of the high-grade Stinger zone. Drilling by PTM in 2002 intersected 3.1 m grading 4.92 g/t Pd+Pt+Au within a broader system, including 19.2 m grading 1.06 g/t Pd+Pt+Au. The Stinger zone has been traced in surface trenches and drilling for 700 m along strike (*Canada Stockwatch*, October 17, 2003).

North American Palladium Ltd. has optioned the Inco Limited Haines and Conacher township properties, adjacent to the former Inco Shebandowan Mine. Geological mapping, deep-penetrating airborne geophysics (VTEM) and followup drilling on the last year's surface discoveries on the Haines property is planned for 2004 (press release, January 6, 2004).

North American Palladium Ltd. has optioned the Lithic Resources Ltd. Roaring River property. The Roaring River mafic intrusive complex is up to 70 km long and up to 15 km wide. Grab samples have returned up to 1.18 g/t palladium, 0.46 g/t platinum, 0.05 g/t gold, 0.094% copper and 0.155% nickel with mineralization described as similar to the Lac des Iles deposit (*Canada Stockwatch*, May 5, 2003). Planned exploration includes geological mapping, lithogeochemical sampling, reverse-circulation drilling and stripping.

MetalCORP Ltd. has staked the Big Lake property in the Hemlo–Mussy Lake area. The Ni-Cu-PGE target is interpreted to be related to the Mid-Continent Rift of Lake Superior and the geochemistry and geophysics is compared to that of the Yellow Dog Peridotite in Upper Michigan (press release, October 29, 2003).

Houston Lake Mining Inc. reported that **Agnico–Eagle Mines Limited** conducted diamond drilling on the Tib Lake property. Intersections of up to 1078 ppb Pd+Pt+Au over 9.20 m, including 2818 ppb Pt+Pd+Au over 1.78 m, were reported in hole TL-02-25 (press release, February 4, 2003). Agnico–Eagle opted not to continue with the second year of the joint venture (*Canada Stockwatch*, February 25, 2003).

Table 2. Assessment files received in Thunder Bay South Resident Geologist's District in 2003.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Aldina Township	Probe Mines Ltd.	2003	DD	2.26719	52A05/NW-058
Amethyst Bay	Grieve, M.	2002	Str, Tr	2.24633	52A10/SW-028
Armistice Lake	Buck Lake Ventures Ltd.	2002	GL, Samp	2.25462	52H05/SW-019
Badger Lake	Gitennes Exploration Inc.	2002	GC, GEM, GM, Samp	2.25432	52H05/NE-003a,b
Bedivere Lake	North American Palladium Ltd.	2003	GM, Lc	2.25031	52B15/SW-026
Bomby Township	AntOro Resources Inc.	2002	GM, VLFEM, Lc	2.25866	42C12/NW-110
Bomby Township	Homestake Canada Inc.	2002	DDH, Samp	2.23773	42C12/NW-114
Brothers and Laberge townships	Lac Explorations Inc.	2001	DDH, Str, Samp	2.25751	42C12/NE-056a-g, 42C12/NW-113a,b
Brothers Township	Lac Exploration Inc.	2002	DDH, Samp	2.25759	42C12/NW-111a-c, 42C12/NE-055a,b
Burchell Lake	Kukkee, K.	2003	Pr, Str, Samp	2.26301	52B10/SE-158
Burchell Lake	Ternowesky, J.	2002	Pr, Samp	2.26141	52B10/SE-157
Cecil Township	Gionet, G.	2002	Str, Tr, Samp	2.24711	42F04/SE-027
Cecil Township	Gionet, G.	2003	Str, Tr	2.26021	42F04/SE-026
Cheeseman Lake	Canplats Resources Corp.	2002	AM	2.24852	52H06/NW-018, 52H11/SW-010
Cheeseman Lake	King, R.	2003	Pr, Samp	2.25705	52H06/NW-015
Cheeseman Lake	King, R.	2003	Pr, Samp	2.25704	52H06/NW-016
Cheeseman Lake	King, C.	2003	Pr, Samp	2.25703	52H06/NW-017
Cheeseman Lake	Poile, R.	2003	Pr, Samp	2.25708	52H06/NW-013
Cheeseman Lake	Poile, R.	2003	Pr, Samp	2.25709	52H06/NW-014
Circle Lake	Platinum Group Metals Ltd.	2002	DDH, Samp	2.26108	52H06/SE-009a,b
Cirrus and Lorna lakes	Teck Cominco Ltd.	2003	DDH, Samp	2.25181	42D16/SE-052, 42D16/NE-033

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Conacher Township	Band-Ore Resources Ltd.	2003	GC, Samp	2.26332	52B09/NE-074
Conmee Township	Calvert, D. and Wing, A.	2003	DD	2.26152	52A05/NE-018
Conmee Township	ValGold Resources Ltd.	2002	GL, Str, DDH, Samp	2.26009	52A12/SE-030
Crystal Lake	BHP Billiton World Exploration Inc.	2002	AEM, GRAV	2.24601	52A04/SE-081a-c, 52A03/SW-023
Dawson Road Lots	Kukkee, P.	2002	Str, Samp	2.24452	52A12/SW-117
Dawson Road Lots	Kukkee, P.	2003	Str, Samp	2.25913	52A12/SW-121
Dawson Road Lots	Kukkee, P.	2003	Str, Samp	2.25643	52A12/SW-120
Duckworth Township	Fournier, E.	2003	Pr, Samp	2.25061	52B09/SE-117
Duckworth Township	Landore Resources Inc.	2002	GL, Samp	2.23870	52B09/SE-116a,b
Duckworth Township	Landore Resources Inc.	2003	GL	2.26005	52B09/SE-118a,b
Duckworth Township	Landore Resources Inc.	2003	GL	2.26340	52B09/SE-121
Duckworth Township	Landore Resources Inc.	2003	GL, Samp	2.26289	52B09/SE-119
Eva Lake	Morehouse, W.	2002	GC	2.25228	52B11/NE-008
Finlayson Lake	Atikokan Resources Inc.	2002	GM, VLFEM, Lc	2.25203	52B13/NE-020
Fluor Island	Avalon Ventures Ltd.	2003	AEM, AM, GL, Samp	2.25641	52A09/NE-003, 52A09/NW-002
Foxtrap Lake	McVicar Minerals Ltd.	2001	Pr, Samp	2.24817	42D15/NE-013
Foxtrap Lake	McVicar Minerals Ltd.	2002	Pr, Samp	2.25233	42D15/NE-014
Foxtrap Lake	McVicar Minerals Ltd.	2002	AEM, AM	2.24773	42D15/SE-012, 42D15/SE-081
Freeborn Township	Fern Elizabeth Gold Expl. Ltd.	2002	Str, Tr, Samp	2.25387	52B13/SE-038
Gillard Lake	Lithic Resources Ltd.	2002	GC, Samp	2.24738	52H12/NW-006
Gillard Lake	Lithic Resources Ltd.	2002	GC, Samp	2.25849	52H12/NW-004, 52H12/SW-020
Gillard Lake	North American Palladium Ltd.	2003	Samp	2.25956	52H12/NW-005
Gorham Township	Luski, M.	2003	GL, Pr	2.26058	52A11/SW-016
Gorham Township	Pitkanen, R. Gurney, S. and Hietapakka, R.	2003	Str, Samp	2.26271	52A11/SW-017
Greenwich Lake	Harper, G.	2002	DDH	2.24381	52A15/SW-021
Greenwich Lake	Pacific Northwest Capital Corp.	2002	DDH, Samp	2.26046	52A15/SW-022
Haines Township	North American Gem Inc.	2003	GM, VLFEM, Lc, Samp	2.25595	52B09/NW-084
Haines Township	Wing Resources Inc.	2003	DD	2.26378	52B09/NW-085
Jean Township	Hietapakka, R.	2003	Tr, Samp	2.26769	52B08/SE-010
Kashabowie Lake	Canadian Golden Dragon Resources Ltd.	2002	DDH, Samp	2.24692	52B09/NW-082
Kashabowie Lake	Canadian Golden Dragon Resources Ltd.	2003	AEM, AM	2.25700	52B10/SE-156, 52B10/NE-017, 52B09/SW-067, 52B09/NW-083

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Killala Lake	Nuinsco Resources Ltd.	2002	GL, Pr, Str, Samp	2.25475	42E02/SE-009
Lac des Iles River	Platinum Group Metals Ltd.	2002	GEM, GM, DDH	2.24542	52H04/SE-028
Laurie Township	Kukkee, P.	2002	Str, Samp	2.24560	52A12/SW-118
Little Sturge Lake	North American Palladium Ltd.	2003	GL, Samp	2.25144	52H02/NW-015, 52H02/SW-024
Little Sturge Lake and Spruce River	East West Resource Corporation	2002	AEM, DD, Samp	2.23795	52H02/NW-017
Lorna and Seeley lakes	Freewest Resources Canada Inc.	2002	GL, Pr, Str, Samp	2.24981	42D16/SE-053, 42D16/SW-118
Lorna Lake	Freewest Resources Canada Inc.	2002	GM, IP, VLFEM, Pr, Tr, Lc, Samp	2.25118	42D16/SE-050
Lorna Lake	Freewest Resources Canada Inc.	2002	GL, Samp	2.24154	42D16/SE-049, 42D16/NE-032, 42D16/NW-026
MacGregor Township	Ciccarelli, M.	2002	Str, Samp	2.25471	52A06/NE-005
Marks Township	Belletini, S.	2001	Str, Tr	2.23735	52A05/SW-022
McTavish Township	Bak, D.	2003	Str	2.26376	52A10/NE-052
McTavish Township	Breezy Mountain Amethyst Mines Ltd.	2003	GL, Str	2.25588	52A10/NE-061
McTavish Township	Stone, T.	2002	Str, Tr	2.24392	52A10/NE-060
Mikinak Lake	Canplats Resources Corp.	2002	HLEM, DDH, Samp	2.25074	52H07/SW-016a,b
Mikinak Lake	McVicar Minerals Ltd.	2000	GRA, GC, GM, Samp	2.23777	52H07/SW-018, 52H06/SE-011, 52H03/NE-015, 52H02/NW-016
Mikinak Lake	McVicar Minerals Ltd.	2001	AEM, AM	2.23881	52H07/SW-014, 52H06/SE-008, 52H03/NE-011, 52H02/NW-014
Mikinak Lake	McVicar Minerals Ltd.	2001	DDH, Samp	2.25283	52H07/SW-017
Molson Lake	Sparton Resources Ltd.	2002	DDH, Samp	2.25077	42C12/NW-112
Olga Lake	SouthernEra Resources Limited	2002	AM, GC	2.23398	42C13/NE-014a,b, 42C13/NW-014a,b, 42F04/SE-024a,b
Pardee and Crooks townships	Falconbridge Ltd.	2002	GL, Samp	2.24485	52A03/SW-022a,b, 52A04/SE-079
Pardee Township	Luski, M.	2001	Pr, Samp	2.24545	52A04/SE-080
Pays Plat Lake	Elgin Lake Mines Ltd.	2003	GC, Samp	2.25968	42D14/NW-074
Pays Plat Lake	Novawest Resources Inc.	2003	GM, VLFEM, Lc	2.25983	42D14/NW-073
Pearson Township	Chaschuk, M.	2001	DDH	2.25782	52A04/NE-006
Pic Township	Barrick Gold Inc.	2001	DD, Samp	2.26329	42D09/NW-127
Pic Township	Teck Cominco Ltd.	2001	DDH, Samp	2.25580	42D09/NW-126
Pic Township	Wilkinson, D.	2001	Pr, Str	2.25670	42D09/NW-125

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Priske Township	Fenwick, K.	2002	GL, Samp	2.24476	42D14/SE-111
Priske Township	Kravchik, S.	2001	Pr, Samp	2.25225	42D14/SE-115, 42D14/SW-047
Priske Township	Kravchik, S.	2001	Pr, Samp	2.24963	42D14/SE-116
Priske Township	Kravchik, S. and Daniels, G.	2002	Pr, Samp	2.24365	42D14/SE-117
Rightangle Lake	Canplats Resources Corp.	2002	DDH, Samp	2.25335	52H03/NE-012
Rightangle Lake	Platinum Group Metals Ltd.	2002	DDH, Samp	2.24705	52H03/NE-013
Rightangle Lake	Platinum Group Metals Ltd.	2002	AM	2.24646	52H03/NE-014
Rope and Upper Aguasabon lakes	Stares, S. and Stares, M.	2003	Samp	2.26245	42E03/SW-049
Rous Lake	Homestake Canada Inc.	2001	DDH, Samp	2.25630	42D09/NE-120a,b
Seeley Lake	Geomaque Explorations Ltd.	2001	Samp	2.25187	42D16/SW-119
Seeley Lake	Geomaque Explorations Ltd.	2001	DDH, Samp	2.25022	42D16/SW-120
Sharp Lake	Buck Lake Ventures Ltd.	2003	GL, Samp	2.25994	52G01/NE-011, 52G08/SE-006
Smiley Lake	Lockyer, R.	2002	Pr, Str, Samp	2.24153	52A14/NW-008
Syine Township	Daniels, G.	2002	Pr, Samp	2.24374	42D14/SE-112
Tartan Lake	Bakovic, D.	2002	Str	2.24344	52A10/SW-026
Tartan Lake	Bakovic, D.	2002	Str, Samp	2.26616	52A10/SW-029
Tartan Lake	Hietapakka, R.	2002	Str, Tr	2.25778	52A10/NW-027a,b
Tartan Lake	Siltamaki, A.	2003	Str	2.25800	52A10/NW-026
Tartan Lake	Stone, T.	2002	Str, Tr	2.24389	52A10/SW-027
Tib Lake	Aho, T.	2002	Str, Tr, Samp	2.25080	52H04/NW-036
Tib Lake	Buck Lake Ventures Ltd.	2002	Samp	2.25151	52H04/NW-038a,b, 52G01/NE-010
Tib Lake	Buck Lake Ventures Ltd.	2002	GL, Samp	2.24455	52H04/NW-035
Tib Lake	Buck Lake Ventures Ltd.	2003	Pr, Samp	2.26049	52H04/NW-039
Tilly Lake	Bumbu, C.	2003	DDH, Samp	2.25688	52B10/SW-095
Tilly Lake	Bumbu, C.	2003	DDH, Samp	2.25881	52B10/SW-096
Tilly Lake	Bumbu, C. and Poirier, R.	2003	DD	2.26637	52B10/SW-098
Tilly Lake	Pele Mountain Resources Inc.	2003	DDH, Samp	2.25954	52B10/SW-097a,b
Tuuri Township	RJK Explorations Ltd.	2003	DDH, Samp	2.24682	42D15/SW-096
Tuuri Township	RJK Explorations Ltd.	2003	GC, Str, Samp	2.25325	42D15/SW-095
Vein Lake	Brenner, M.	2002	Pr, Str, Samp	2.25350	42E01/NW-010
Wabikoba Lake	Barrick Gold Inc.	2003	GEM, GM	2.26328	42C12/NW-115
Wabikon Lake	Phoenix Matachewan Mines Inc.	2002	GL, Samp	2.24761	52H06/SW-029a-c
Walsh Township	Renner, R. and Bond, J.	2002	Pr, Samp	2.26732	42D15/SE-082
Weaver Lake	Stares, S.	2002	Pr, Samp	2.24724	52G09/SE-006

Table 3. Exploration activity in the Thunder Bay South Resident Geologist's District in 2003 (keyed to Figures 1 and 2).

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

No.	Company or Individual (Occurrence Name or Property)	Township or Area (Commodity)	Exploration Activity
1	Aavdex Corporation (Black Fly property)	Atikokan (Au)	Pr, Samp
2	Anderson, C. (Location 3 property)	McTavish Township (amethyst)	Pr, Samp
3	AntOro Resources Inc. (Golden Hemlo I and II properties)	Wabikoba Lake (Au)	DD
4	AntOro Resources Inc. (White Lake property)	White Lake (Au)	GEM, GM
5	Atikokan Resources Inc. (Bufo Lake property)	Norway Lake (Au)	GL, Pr, Samp
6	Atikokan Resources Inc. (Finlayson Lake property)	Finlayson Lake (Au, Zn, Cu)	Pr, Samp
7	Atikokan Resources Inc. (Lumby Lake property–Spoon Lake)	Norway Lake (Ag, Cu, Zn, Pb)	Bulk
8	Beaufield Consolidated Resources Inc.–Sparton Resources Inc. (Qued property)	Wabikoba Lake (Au)	DD
9	Beaufield Consolidated Resources Inc.–Sparton Resources Inc. (Little Black River property)	Mussy Lake (Au)	DD
10	Beaufield Consolidated Resources Inc.–Sparton Resources Inc. (Cedar Creek property)	Bomby Township (Au)	DDH
11	Bjorkman, K. (Sunshine property)	Miranda Lake (Au)	Pr, Samp
12	Bjorkman, K. (Atikokan West Katarina zone)	Asmussen Township–Miranda Lake (Au)	Pr, Samp
13	Canadian Empire Exploration Corp. (Hemlo West property)	Pic Township (Au)	DD
14	Canadian Golden Dragon Resources Ltd.–Platinum Group Metals Ltd. (South Legris Lake)	Lac des Iles–Max Lake (PGE, Cu, Ni)	GC, DD
15	Canadian Golden Dragon Resources Ltd. (Tilly Creek property)	Tilly Lake (Au, Cu)	Pr, Samp
16	Canadian Golden Dragon Resources Ltd. (Vanguard property)	Kashabowie Lake–Burchell Lake (Cu, Zn, Au)	AEM, AM, Pr, Str, DD, Samp
17	Canplats Resources Corporation (Geikie property)	Cheeseman Lake (PGE, Cu, Ni)	DD
18	Canplats Resources Corporation (Mount property)	Pangloss Lake (PGE, Cu, Ni)	DD
19	Canplats Resources Corporation (Posh property)	Lunch Creek (PGE)	AM
20	Canplats Resources Corporation (Voltaire–Johnspine property)	Pangloss Lake (PGE, Cu, Ni)	AM, DD

No.	Company or Individual (Occurrence Name or Property)	Township or Area (Commodity)	Exploration Activity
21	Canplats Resources Corporation–Platinum Group Metals Ltd. (Stucco property)	Rightangle Lake–Circle Lake (PGE, Cu, Ni)	AM, DD
22	Canplats Resources Corporation–Teck Cominco Limited (Mikinak West property)	Mikinak Lake (PGE, Cu, Ni)	AM, GEM, DD
23	East West Resource Corporation (Burchell property)	Shebandowan (Au, Cu, Zn)	AEM, Pr, DD, Samp
24	East West Resource Corporation (Clay property)	Shebandowan (Au)	Pr, Samp
25	East West Resource Corporation (Deaty property)	Shebandowan (Au)	AEM, AM, Pr, Samp
26	East West Resource Corporation (Glacier property)	Cosgrove Lake (Cu, Au)	GL, Pr, Samp
27	East West Resource Corporation (Hamlin property)	Shebandowan (Au)	GL, Pr, Samp
28	East West Resource Corporation (Jackpine property)	Blair Lake (Cu, Au)	GL, Pr, Samp
29	East West Resource Corporation (Obadinaw property)	Shebandowan (Au)	Pr, Samp
30	East West Resource Corporation (Powell property)	Shebandowan (Au)	Pr, Samp
31	East West Resource Corporation (Shear property)	Shebandowan (Au)	Pr, Samp
32	East West Resource Corporation (Stop property)	Little Sturge Lake (PGE, Cu, Ni)	AEM, AM, DD
33	East West Resource Corporation–Canadian Golden Dragon Resources Ltd. (Disrael–Seagull property)	Leckie Lake (PGE, Cu, Ni)	AEM, AM, GC, GEM, GL
34	East West Resource Corporation–Teck Cominco Limited (Hele property)	Hele Township (PGE, Cu, Ni)	AM
35	Fenwick, K. (Black Fly property)	Freeborn Township (Au)	Pr, Samp
36	Fern Elizabeth Gold Exploration Ltd. (Elizabeth property)	Freeborn Township (Au)	Pr, Str, Samp
37	Freewest Resources Canada Inc. (Larose property)	Moss Township (Au)	GC, GL, GM, IP, Pr, Str, DD, Samp
38	Freewest Resources Canada Inc. (Smoke Lake property)	Lorna Lake (Au)	IP, DD, Samp
39	Freewest Resources Canada Inc. (Sungold property)	Powell Lake (Au)	GM
40	Gionet, G. and M. (Faries Lake property)	Cecil Township (Cu, Ni, Zn, PGE)	Pr, Str, Tr, Samp, Beep
41	Gionet, G. and M. (Moshkinabi property)	Roberts and Herbert townships (Cu, Ni, PGE)	Pr, Tr, Samp, Beep
42	Hackl, J. and J. (Bolton Bay)	Lac des Mille Lacs (Au)	Pr, Str, Samp
43	Hackl, J. and J. (Dam property)	Shabaqua (Au)	Pr, Str, Samp
44	Hackl, J. and J. (Moosecalf East property)	Laurie Township (Au)	Pr, Str, Samp
45	Hackl, J. and J. (Redfox property)	Powell Lake (Au)	Pr, Str, Samp
46	Hakala, J.–Holbik E. (Hidden Treasure property)	Calm Lake (Au)	Pr, Samp
47	Hinterland Metals Inc. (Shabaqua property)	Blackwell Township (Au)	Pr, Samp
48	Houston Lake Mining Inc.–Agnico Eagle Mines Ltd. (Tib Lake property)	Tib Lake (PGE)	DDH
49	JonPol Explorations Limited–Saxony Explorations Ltd. (Smoke–Goodchild lakes property)	Lorna Lake–Cirrus Lake (Au)	GL, Pr, Str, DD
50	Kukkee, P. (Gold Cache property)	Horne Township (Au)	Str, Samp
51	MetalCORP Limited (Big Lake property)	Hemlo (Cu, Ni, PGE)	Pr, Samp
52	Moss Lake Gold Mines Ltd. (Moss Lake property)	Moss Township (Au)	DD, Samp
53	Noranda Inc. (Blake–Pardee property)	Pardee and Crooks townships (Cu, Ni, PGE)	DD

No.	Company or Individual (Occurrence Name or Property)	Township or Area (Commodity)	Exploration Activity
53	Noranda Inc. (Blake–Pardee property)	Pardee and Crooks townships (Cu, Ni, PGE)	DD
54	North American Gem Inc. (Crayfish property)	Shebandowan–Haines Township (Au, Cu, Ni, PGE)	Pr, Str, Samp
55	North American Palladium Ltd. (Lac des Iles Mine property)	Lac des Iles (Cu, Ni, PGE)	GEM (MT), DDH, Prefeasibility Study
56	North American Palladium Ltd. (Haines Gabbro property)	Shebandowan (Cu, Ni, PGE)	GL, Tr, Lc, Samp
57	North American Palladium Ltd. (Chief Peters property)	Brule Lake (Cu, Ni, PGE)	GM, Tr, Lc, Samp
58	North American Palladium Ltd. (Roaring River property)	Garden Lake (Cu, Ni, PGE)	GC, GL, GM, Lc
59	North American Palladium Ltd. (Weaver Lake property)	West Roaring River (Cu, Ni, PGE)–Weaver Lake (PGE)	DDH
60	NovaWest Resources Inc. (Nickel Royale property)	Schreiber (Cu, Ni, PGE)	GEM, GM, Pr, Lc, Samp
61	Pele Mountain Resources Inc. (Ardeen Mine)	Moss Township (Au)	DD
62	Platinum Group Metals Ltd. (Dog River property)	Senga Lake (PGE)	GL, Pr, Lc, Samp
63	Platinum Group Metals Ltd. (Faries Lake property)	Cecil Township (Cu, Zn, Ni, PGE)	GEM, Pr, DD, Samp
64	Platinum Group Metals Ltd. (Moshkinabi Lake property)	Roberta and Herbert townships (Cu, Ni, PGE)	Pr, DD, Samp
65	Platinum Group Metals Ltd. (Taman and Taman East properties)	Senga Lake (PGE)	AEM, Pr, Samp
66	Platinum Group Metals Ltd.–East West Resource Corporation (Pebble property)	Circle Lake (PGE)	GC, Pr, DD, Samp
67	Platinum Group Metals Ltd.–East West Resource Corporation–Maple Minerals Ltd. (Lac des Iles River property)	Shelby Lake (PGE)	DD
68	Platinum Group Metals Ltd.–New Claymore Resources Ltd. (Shelby Lake property)	Shelby Lake (PGE)	DD
69	Probe Mines Ltd. (Serpent Creek property)	Aldina Township (Cu, Zn)	DD
70	RJK Explorations Ltd. (Fire Mountain property)	Tuuri and Walsh townships (Au)	DD, Str
71	RJK Explorations Ltd. (Wedge property)	Laurie Township (Au)	GL, Pr, DD, Lc, Samp
72	RJK Explorations Ltd.–GLR Resources Inc. (Stares–Calvert property)	Aldina and Sackville townships (Cu, Zn, Pb, Ag)	GL
73	RK Exploration Group (Schreiber properties)	Priske and Syine townships (Au)	Pr, DD, Samp
74	Sande, D. and Stewart, E. (Sande–Stewart property)	Sawbill Bay (Au)	Str, Tr, Samp
75	Staccato Gold Resources Ltd. (Shebandowan property)	Swamp River (Au)	GL, Pr, DD, Samp
76	Teck Cominco Limited (White River property)	Laberge and Brothers townships (Au)	DD
77	Tri-Alpha Investments Ltd. (Big Duck Lake property)	Rope Lake–Pays Plat (Au)	Pr, Str, Samp
78	ValGold Resources Ltd. (Tower Mountain property)	Conmee Township (Au)	GL, Pr, Str, DD, Samp
79	Wahl, R. and Renner, R. (Fire Mountain properties)	Tuuri Township (Au)	Pr, Samp
80	Wahl, R. (Heron Bay property)	Pic Township (diamonds)	Pr, Samp

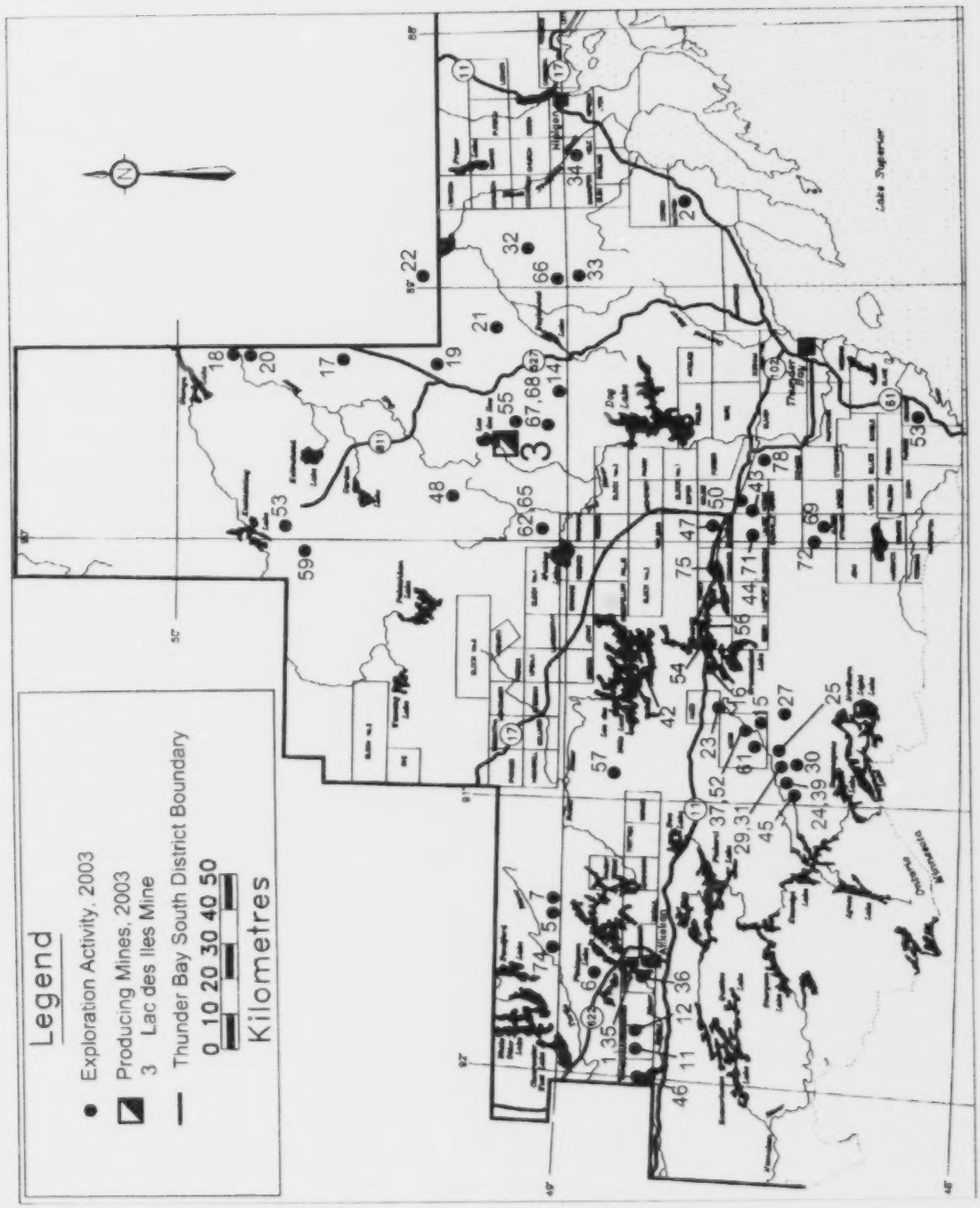

Figure 1. Thunder Bay South Resident Geologist's District (western portion) exploration activity in 2003.

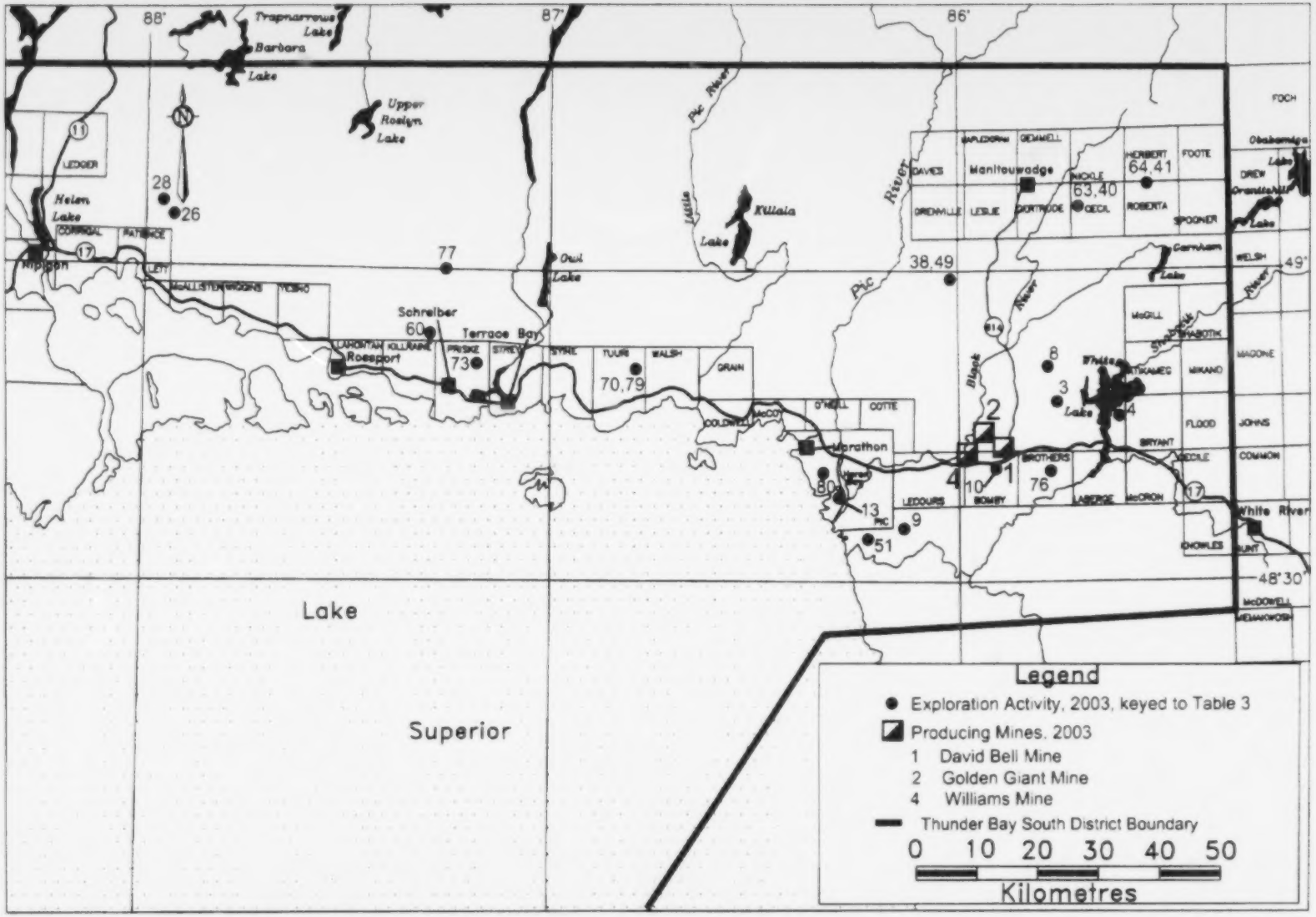

Figure 2. Thunder Bay South Resident Geologist's District (eastern portion) exploration activity in 2003.

RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES

The Thunder Bay South District is staffed by B.R. Schnieders, Regional Resident Geologist, J.F. Scott and M.C. Smyk (until April 1, 2003), District Geologists, M.S. O'Brien, Regional Support Geologist and M.A. Magee, District Support Geologist. M. Tuomi worked as the Thunder Bay District Support Geologist until September 2003.

The Thunder Bay South Resident Geologist Program (RGP) dealt with more than 4350 inquiries from the mining sector, other government agencies and the general public. Bi-weekly visits were made to the Marathon satellite office from May until October, usually on Tuesday afternoons. Service was also provided to clients in the Thunder Bay Drill Core Library, as well as remote core storage facilities in Conmee Township (30 km west of Thunder Bay) and in Marathon.

RGP staff conducted 50 property visits in 2003 (Table 4). Ten field trips were conducted or attended. Six posters displays were assembled and manned at the Cordilleran Round-Up in Vancouver, the Prospectors and Developers Association of Canada convention in Toronto, the Northwestern Ontario Mines and Minerals Symposium in Thunder Bay and various open houses and conferences. Five technical presentations were delivered. Logistical support and field assistance were given to Ontario Geological Survey geoscientists conducting field work in the Thunder Bay South District. B.R. Schnieders and J. F. Scott were also co-authors of an article for *Summary of Field Work and Other Activities 2003* "Regional geology of the Lac des Iles area" (Stone et al. 2003c).

R. Tuomi, Data Compilation Geologist, Thunder Bay posted data, including exploration activity and recommendations, on the RGP web site. He also worked on preparing digital maps for the web site, reconstructing the RGP web site, editing of the Mineral Deposit Inventory database model, and designing the success tracking database.

B.R. Schnieders and J.K. Mason attended the 2003 Cordilleran Round-Up held in Vancouver, British Columbia. A provincial booth filled with rock samples, cut and polished rock slabs and drill core, display material, handouts, recommendations, and promotional materials was manned. Commodities such as PGE, diamonds, rare metals, base metals, gold and Operation Treasure Hunt products were highlighted.

M.C. Smyk and R. Tuomi attended the Institute on Lake Superior Geology meeting in Iron Mountain, Michigan. B.R. Schnieders, M.C. Smyk and J.F. Scott are representatives on the Lake Nipigon Region Geoscience Initiative Science Committee. J.F. Scott was actively involved with the application of global positioning system (GPS) technology (e.g., property, road, detailed grid, stripped area, and air photo base maps), as well as Provincially Significant Mineral Potential (PSMP) maps and geographic information systems (GIS) information. In conjunction with the Northwestern Ontario Prospectors Association (NWOPA) and the Thunder Bay Lapidary and Mineral Society, several RGP staff members assisted with the organization and presentation of a mining and minerals awareness area at the Thunder Bay Children's Festival from June 13 to 16, 2003. This "soft-sell" was presented to approximately 2500 children via rock decorating, gold panning and "colouring a mine" activities.

Mark O'Brien, Regional Support Geologist, provided client assistance and GIS support for RGP staff in northwest Ontario from January to October 2003. This assistance included map and poster production for regional mines and minerals symposia; Room to Grow–Longlac Wood Industries and Northern Boreal Initiative–Whitefeather Forest. A presentation on lapidary opportunities in the region was given to the Thunder Bay Lapidary and Mineral Society on May 16, 2003. From June 12 to 14, 2003, assistance was provided with NWOPA displays at the Thunder Bay Children's Festival. From June to August, approximately 90 MDI records were revised in the Meen–Dempster portion of the central Uchi Subprovince. Desiree Wyant filled the Regional Support position from October to December in a contract role, while M. O'Brien was on temporary assignment to the Thunder Bay Area Team, Regional Economic Development Branch, Northern Development Division.

Table 4. Property visits conducted by the Thunder Bay South Resident Geologist's Office in 2003.

Number	Property or Occurrence with Commodity	Number	Property or Occurrence with Commodity
1	Black vein occurrence: Au	26	Moosecalf East occurrence: Au
2	Blue Points amethyst occurrence: Amethyst	27	Morley occurrence: Au, Py
3	Bufo Lake occurrence: Au	28	Mrakic Road, MacGregor Township: Au, Cu-Zn
4	Burchell Lake–Whitefish Lake area: Cu, Zn	29	North Coldstream occurrence: Cu, Ag, Au
5	Chub Copper occurrence: Cu	30	Ontario Gem East: Amethyst
6	Consolidated Louanna gold mine: Au	31	O'Sullivan Lake occurrence: Au
7	Cornell zone occurrence: Cu, Au	32	Pearl Granite Quarry: Industrial Minerals
8	Dam occurrence: Au	33	Prairie River occurrence: Cu, Zn
9	DanBill amethyst occurrence: Amethyst	34	Schreiber porphyries–Downey occurrence: Mo, Cu
10	Double Deuce: Au	35	Shabaqua conglomerate occurrence: Au
11	Fern Elizabeth property: Au	36	Smoke Lake occurrence: Au
12	Fire Mountain occurrence: Au	37	Span Lake occurrence: Au
13	Frank West occurrence: Au	38	Stares–Calvert occurrence: Cu, Zn
14	Gale occurrence: Cu, Au	39	Sturgeon Bay Road cobblestone occurrence: Industrial Minerals
15	Geikie property: Cu, Ni, PGE	40	SunGold occurrence: Au
16	Hidden Treasure occurrence: Au	41	Sunshine occurrence: Au
17	Jackfish cobbles occurrence: Industrial Minerals	42	Terrace Bay batholith occurrence: Cu, Mo
18	Katarina zone occurrence: Au	43	Valvasori occurrence: Cu, Zn
19	Lac des Iles Mine: PGE, Ni, Cu	44	Vanguard West occurrence: Cu, Zn, Ag, Au
20	Larose property: Au	45	Vanguard East occurrence: Cu, Zn, Ag, Au
21	Lumby Lake–Heron Track occurrence: Ag, Cu, Zn, Pb	46	Vanguard Extension occurrence: Cu, Zn, Au, Ag
22	Marks Township occurrence: Amethyst	47	Waverley Road: Cu, Zn, Au
23	Marmion Lake occurrence: Au	48	Wedge occurrence: Au
24	Mayflower occurrence: Au	49	West Richardson occurrence: Cu, Zn, Ag
25	Mills Creek occurrence: Au	50	Williams Mine: Au

PROPERTY EXAMINATIONS

Larose Occurrence

The Larose occurrence (UTM Zone 15, 660778E, 5379755N) is located in Moss Township approximately 120 km west of Thunder Bay. The property is accessible from the Swamp Road off of Highway 11, then by the Tandem Loop logging road. Gold mineralization was discovered by R. and D. Kwiatkowski in May 2003. The property was optioned to Freewest Resources Canada Inc., whose prospecting and stripping programs led to the discovery of several gold zones or occurrences, including (from the southwest to the northeast) the J & R, Larose, the P, Central P (P#2), Snoopy, Porphyry, and Northwest View. Combined, these zones make up the "Main zone", which has a strike length of 1500 m (Freewest Resources Company Inc., press release, November 11, 2003). Two separate shear zones are observed at the Larose occurrence at 48/70 northwest. The shear zones are up to 7 m wide and hosted in thinly bedded, turbiditic wacke and siltstone. The sheared and altered, host metasedimentary rocks display quartz veining and stringers, chloritization, silicification, carbonatization, sericitization and sulphidization. Fine-grained pyrite and pale visible gold occur in the milky-white to maroon quartz stringers. Sugary, recrystallized quartz veins and pods are up to 30 cm wide. A chip sample collected by the authors across 30 cm of the altered metasedimentary host and quartz stringers assayed 70.6 g/t gold (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

A parallel shear zone on the same stripped outcrop is located 10 m to the northwest of the aforementioned shear zone. The second shear zone is hosted in "DE" turbidites (southeast younging). Bedding and/or cleavage relationships suggest tight to isoclinal folding is present. Here, the shear zone is sulphide rich. Galena, sphalerite, pyrite and arsenopyrite are associated with "rotten" sugary quartz. Crosscutting veins and structures striking 152° occur in the non-magnetic mineralized zone. A 30 cm chip sample collected by the authors, across the base metal-bearing zone sample, returned 15.5 g/t gold, 5.2% lead and 0.58% zinc (ibid.). At one location, the zone appears more sericitic. Relict textures within the host rocks suggest a deformed and altered quartz-feldspar porphyritic protolith.

The "P" zone is located approximately 100 m northeast of the Larose occurrence (UTM Zone 15, 660849E, 5379846N) and is made up of multiple, parallel, shear zones in gossanous metasedimentary rocks. One of the shear zones is a base metal-rich shear zone up to 1.5 m wide, likely the extension of the shear zone at the Larose occurrence. Pyrite, galena, sphalerite, arsenopyrite, visible gold and minor chalcopyrite were observed. Selected grab samples of the base metal-rich zone returned up to 228.5 g/t gold, 1.87% lead and 1.19% zinc. A second selected grab sample of the base metal-rich shear zone returned 170.1 g/t gold, 3.12% lead and 3.00% zinc (ibid.). Shear-related, laminated or banded sulphides were noted at several locations, likely structural in nature. Freewest Resources reported up to 371.94 g/t gold (10.85 ounces per ton gold) from the P2 or Main zone (Freewest Resources Company Inc., press release, August 20, 2003). At the Central P zone (P#2 zone) (UTM Zone 15, 660865E, 5379866N), a discrete shear zone in altered metasedimentary rocks displays recrystallized quartz stringers and small pinheads of visible gold. A grab sample collected by the authors assayed 149.6 g/t gold (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

At the Snoopy occurrence (UTM Zone 15, 660956E, 5379982N), further evidence of sheared quartz-feldspar-phyric rocks is evident. Aplite and feldspar-porphyritic dikes, which display a reddish (potassic or hematitic) alteration. A chip sample collected by the authors, across 15 cm of sheared and silicified metasedimentary rock, assayed 3.58 g/t gold (ibid.).

The Porphyry zone (UTM Zone 15, 661131E, 5380130N) consists of a synvolcanic, likely intrusive quartz-feldspar porphyry, which occurs as boudinaged lenses hosted by wackes and siltstones. Quartz veins or lenses up to 0.6 m wide occur near the contact of the porphyry within the metasedimentary rocks. A chip sample across 1 m of less-altered porphyry, with quartz and feldspar phenocrysts, and containing minor, fine pyrite, returned 208 ppb Au. A grab sample of the quartz vein collected by the authors, returned 4.08 g/t gold (ibid.).

At the J&R zone, located approximately 350 m to the southwest (UTM Zone 15, 660411E, 5379604N), a large stripped area exposed up to 8 separate shear zones, across a 94 m width. Individual shear zones strike 60° and vary from 15 cm to 4 m in width. Several lamprophyre dikes and an aplite dike were noted. The metasedimentary rocks display evidence of transposition and fault offsets. Extensional quartz veins, oriented obliquely to the shear zone foliation, are also present. A narrow, base metal-rich, shear zone or vein is also present. A grab sample collected by the authors returned 2.5 g/t gold (ibid.).

Prospecting in late 2003 extended the known mineralization to 1500 m when the Northwest View occurrence was discovered. Grab samples collected by Freewest Resources assayed up to 62.93 g/t gold (Freewest Resources Canada Inc., press release, November 11, 2003).

Freewest Resources described the Northwest View occurrence in 2003 as

> The Northwest View occurrence consists of a sheared sericitic alteration zone developed at the contact between sedimentary rocks and quartz-feldspar porphyry sills. Alteration and deformation are exposed over a true width of about 10 meters at this site. The highest gold grades were obtained from shear zones characterized by quartz flooding and sericitic alteration, and containing moderate to appreciable amounts of galena, sphalerite and chalcopyrite. (ibid.)

As mapped by Osmani (1997), the Larose occurrence is underlain by sheared, folded and altered metasedimentary rocks, mainly turbidite sequences of wacke and siltstone, which have been intruded by felsic intrusive rocks, including hornblende syenite, feldspar porphyry and quartz-feldspar porphyry. A major northeast (30 to 50°) striking fault (Boundary fault zone) is located approximately 2 to 3 km southeast of the Larose occurrence. Osmani (1997, p.48) described it as

> The contact between the QSB (Quetico Sedimentary Belt) and the SGB (Shebandowan Greenstone Belt) in the western study area is strongly sheared, faulted where exposed; elsewhere it is underlain by linear topographic features. The observed shearing, faulting, and topographic lineaments within the contact zone are interpreted by the author to represent a broad deformation zone or, as termed in this report, "Boundary Fault Zone (BFZ)". In the Obadinaw River area, for example, the contact is a several hundred metre wide zone and consists of numerous northeast-trending (30 to 50 degrees), discrete shear zones. Major rock types within the contact zone are moderately to extremely schistose and are variably affected by chloritization, silicification and in places, sulphidization. Many faults and shear splays related to the BFZ occur in the supracrustal rocks within the Huronian (Ardeen) Mine area. Some of these structures and spatially emplaced quartz veins within or near them host gold mineralization.

The Boundary fault zone marks the inferred boundary between the Quetico and Wawa subprovinces. Schnieders et al. (1998, p.34) have questioned that proposed boundary:

> Northwest of the boundary, metasedimentary rocks of the Quetico subprovince predominate. They have been intruded by quartz-feldspar porphyries and gabbro (Harris 1970; Osmani 1997). Some areas that have been mapped as gabbro, are in fact, pillowed, mafic flows. This is especially true of an area between Tilly and Zephira creeks, where pillowed flows are in contact with Quetico metasedimentary rocks. Further study in this area may suggest redefinition and relocation of the Quetico–Wawa subprovince boundary.

The Larose occurrence in Moss Township represents a new model of gold mineralization hosted by clastic metasedimentary rocks, previously considered by many explorationists to have low mineral potential. Logging roads, improved access and basic prospecting, rather than shrewd geological principles, led to the discovery of the Larose occurrence and once again proved the age-old adage "*Gold is where you find it!*" For recommendations and additional target areas, refer to "Recommendations For Exploration".

Bufo Lake Occurrence

The Bufo Lake occurrence is located in the Lumby Lake greenstone belt of the Wabigoon Subprovince, located approximately 40 km northeast of Atikokan. Access is gained via the Premier Lake road at the 41 km marker. A gold occurrence was re-discovered by Ray Bernatchez while prospecting in 2003. The Bufo Lake occurrence (UTM Zone 15, 619158E, 5432080N) consists of a quartz-carbonate vein striking 90 to 120° and dipping nearly vertically. The quartz-carbonate vein appears to be at the contact between a quartz-phyric, diorite or tonalite and highly deformed mafic metavolcanic rocks or gabbro (chlorite schist). The vein is exposed by stripping for 15 m.

The quartz-carbonate vein varies in width from 15 to 90 cm and displays a crack-seal texture. The vein is hosted by a carbonatized schist, which includes green mica, iron carbonate, pyrite, minor chalcopyrite and possibly galena or a telluride. The carbonatized schist contains euhedral pyrite crystals and was interpreted to represent an altered and deformed porphyry or diorite. A chip sample across 30 cm of quartz vein collected by the authors assayed 9.03 g/t gold and 14 g/t silver. A chip sample across 30 cm of the altered porphyry (carbonate schist) assayed 1.69 g/t gold (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

The Bufo Lake occurrence is located approximately 1 km west of the old Mining North Pit 5, where samples of quartz-carbonate vein in float returned up to 2.33 ounces per ton gold (Schnieders and Dutka 1985). The original float boulder was 30 to 50 cm across and consisted of rusty-weathering quartz and euhedral pyrite. A smoky quartz vein hosted by a metavolcanic schist with green mica returned 0.14 ounce per ton gold. A sample from the old pits immediately south of Bufo Lake (UTM Zone 15, 619633E, 5431817N) collected by the authors assayed 121 ppb Au and 6032 ppm Cu (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

The Blowout and K14521 occurrences are located in the same general area, approximately 2 km west of the Mining North pits (Pit 5) south of Bufo Lake. Gold mineralization is reported on claim K14521 on the east shore of Redpaint Lake, 400 m south of the narrows. A 90 cm wide quartz vein was exposed for a length of 7.5 m and a 1.8 m channel sample returned 4.8 ounces per ton gold (Woolverton 1960). The vein is hosted by a shear zone in diorite (Woolverton 1960). Woolverton (1960, p.47) also described the Alcock occurrence, approximately 2 km northwest of Bufo Lake as

> The main showing lies 600 feet (180 m) south of the north bay of Redpaint Lake, on claim K.11821, and consists of six test pits and stripping extending for 125 feet (37.5 m) along the southeast side of a gully trending N.35 degrees E. The valley marks the trace of a strong regional fault. Quartz-ankerite veins up to 5 feet (1.5 m) in width occur in the crests of folds, in splintery sericite-carbonate schists associated with this fault. Mineralization consists of pyrite and chalcopyrite; no visible gold was noted. Mr. Alcock reports that grab samples from this showing assayed 0.07 - 1.99 ounces of gold per ton, and that a channel sample, taken across 4.5 feet (1.4 m), assayed 1.38 ounces of gold...Gold is reported to occur in the wallrock schists as well as the veins.

A major northeast-trending fault (Red Paint Lake fault zone) intersects a major east-trending fault or shear zone (Lumby Lake shear zone). Woolverton (1960) described the Lumby Lake shear zone: "Gold occurs in the Lumby Lake shear zone and is concentrated in siliceous zones and associated with copper, lead, zinc and silver. The gold content is very low however, a siliceous zone with disseminated sulphides is said to have assayed 0.034 ounce per ton over 20 feet; with Ag, 0.57 ounce per ton; Cu, 0.25 percent; Zn, 0.22 percent." A grab sample from the Anderson Pits, located approximately 1 km east of Bufo Lake, assayed 0.10 ounce per ton gold, 0.96 ounce per ton silver, 1.66% copper, 2.44% zinc and 0.20% lead (Schnieders and Dutka 1985). Diamond drilling by D. Saunders in 1988 on the west shore of Lumby Lake, approximately 500 m east of the Anderson Pits, returned 10 475 ppb Au, 44 ppm Ag, 2.25% copper and 0.55% zinc across 1 m (DDH 88-2, Resident Geologist's Files, Thunder Bay South District, Thunder Bay). Pyrite, chalcopyrite and fuchsite (green mica) are reported in the holes. North of Morris Lake (Little Morris Lake) an assay of 4381 ppb Au across 1 m is also reported by D. Saunders.

The area between the south end of Redpaint Lake, north to Bolio Lake and east to Lumby Lake, including Blowout, Claw, Twobay, Bufo, Cawing and Morris lakes, is considered an excellent gold exploration target. Major northeast-trending fault zones and east-trending splaying shear zones intersect, and likely control, the intrusion or emplacement of a major quartz-porphyry-diorite complex (Woolverton 1960). Gold, copper, zinc and lead mineralization is associated with highly deformed, altered and carbonatized metavolcanic rocks, diorite, high-level intrusive porphyries and quartz-carbonate veins. Air photo-lineament studies, prospecting, soil geochemical surveys, stripping and sampling is warranted in the area.

Elizabeth Mine Property

Activity on the Elizabeth Mine property located 11 km northwest of Atikokan dates back to 1900, when gold was discovered in quartz veins north of Rice Lake (Modred Lake) at the contact between the Eye–Dashwa pluton and the Steeprock greenstone belt (Fumerton 1986). More than 411 ounces of gold was mined from the main Elizabeth #2 shaft (Schnieders and Dutka 1985). In excess of 25 quartz veins have been discovered on the property to date and, from 1986 to 1989, Société Minière Mimiska completed 63 313 feet of diamond drilling on 4 main veins (Elizabeth #1, Elizabeth #2, Elizabeth #6 and Grizzly veins) and outlined 244 083 t at 4.81 g/t gold (Beauregard 1990). Some significantly drilled vein intersections include

Vein	Diamond Drill Hole	Grade
Elizabeth #2	ME-87-10	9.82 g/t Au over 8.05 m
	ME-87-46	10.29 g/t Au over 2.74 m (approximately 180 m vertical depth)
Elizabeth #1	ME-87-24	29.83 g/t Au over 1.5 m
	ME-88-123	9.20 g/t Au over 1.67 m
Elizabeth #6	ME-87-71	8.15 g/t Au over 1.5 m
	ME-87-57	9.10 g/t Au over 1.7 m
Grizzly	ME-88-98	24.43 g/t Au over 2.7 m
	ME-88-99A	23.28 g/t Au over 1.72 m
Isolated quartz vein	ME-88-113	54.18 g/t Au over 0.62 m

Beige, Stringer and Elizabeth #2	ME-88-129	2.38 g/t Au over 1.2 m (69.63 to 70.83 m) 1.68 g/t Au over 1.51 m (85.37 to 86.88 m) 4.74 g/t Au over 5.01 m (92.53 to 97.54 m) 3.08 g/t Au over 1.90 m (102.20 to 104.10 m) 14.38 g/t Au over 1.90 m (126.35 to 128.25 m)
Elizabeth #2 – Contact vein	DDH ME-87-04	34.74 g/t Au over 1.5 m (hosted by altered granite) (1.117 ounces gold per ton over 5 feet) (Beauregard 1990)

Bulk samples from the Elizabeth #2 vein returned: 1) 2000-pound sample divided into 8 aliquots; mean 0.56 ounce per ton gold; maximum 0.96 ounce per ton gold; and minimum 0.45 ounce per ton gold; 2) two 150-pound samples; 1.26 ounces per ton gold; and 3.12 ounces per ton gold; and 3) one 200-pound sample: 1.01 ounces per ton gold; 0.55 ounce per ton silver, 0.49% copper and trace amounts of arsenic (Fumerton 1986).

Diamond drilling has demonstrated the persistence of the main Elizabeth #1 and #2 veins structures for more than 600 m along strike and to a vertical depth of more than 200 m. The widths of the ore zones rarely exceed 1.5 m (Beauregard 1990). Parallel or *en échelon* veins, such as the Elizabeth #6 and Grizzly veins, are also present and persist at depth. The Elizabeth #6 vein appears to be a deep-seated vein that could potentially increase in size at depth (Beauregard 1990). The Elizabeth #2 and Grizzly ore shoots plunge 55° north, while the Elizabeth #1 and #6 zones plunge 48° south (Beauregard 1990; Resident Geologist's Files, Thunder Bay South District, Thunder Bay). The Elizabeth #1, #6 and Grizzly veins are crack-seal textured and hosted by shear zones in mafic metavolcanic rocks and diorite. The Elizabeth #2 vein is hosted by a more brittle rock at the contact between tonalite and diorite, and occurs as fracture fillings (Beauregard 1990). The Elizabeth #2 structure was tested down to the 230 m level and, from the data obtained, it appears that the #2 zone may be widening at depth (Beauregard 1990).

A second structural corridor was also sampled by Resident Geologist Program staff in 2003 and includes the high grade Bernie–Mitch vein (spectacular visible gold in quartz boudins up to 30 cm wide), Cliff vein (4.4 ounces per ton gold, grab sample, Resident Geologist's Files, Thunder Bay South District, Thunder Bay), S-vein (9.4 g/t gold, grab sample 2003; ibid.), Road vein (9.5 g/t gold, grab sample 2003; ibid.) and Otter vein (8.9 g/t gold, grab sample 2003; ibid.) (Figure 3). A large pyroxenite-lamprophyre dike intrudes along this north-trending fault and several of the shear-hosted, crack-seal-textured quartz veins, such as the Bernie–Mitch, S, Cliff, Road and Otter veins, appear to have been sheared, folded, faulted and boudinaged along or near this structure. The Bernie–Mitch, S and Otter veins are structurally similar to the shear-hosted Elizabeth # 1, #6 and Grizzly veins. Due to the presence of the high-grade gold at the Bernie–Mitch vein, further investigation along strike and at depth (down-plunge) is warranted. A major soil geochemical anomaly is present northeast of the Otter vein and south of the Adit vein (Resident Geologist's Files, Thunder Bay South District, Thunder Bay). An air photo-lineament study would help define prospective structures. North- and northeast-trending structures, as well as east-trending cross structures, should be prospected, stripped, sampled and diamond drilled. Recent logging and road construction provides good access into the Elizabeth property.

Past exploration and drilling has focussed on the main 20° striking Elizabeth #1 and #2 (N20° E) structure and the granite–greenstone contact. Field evidence suggests several generations of quartz veins, including stacked or *en échelon* veins in the area of the Elizabeth #1 and #2 shafts. North-northeast-trending faults and a series of east-trending, right-lateral cross-faults offset the granite–greenstone contact and dissect the area into a series of fault-bounded lozenges. This brittle deformation may have provided conduits for gold-bearing solutions. This pattern appears to continue at the Harold Lake property and should also be investigated at the Bergman occurrence, where a high-grade pocket of gold was discovered in the 1950s (Schnieders and Dutka 1985). Fumerton (1986) mapped a coarse-grained, muscovite-chlorite (altered?), and a possibly older, leucotonalite, which is adjacent and possibly genetically related to, the gold mineralization on the Bergman, Harold Lake and Elizabeth properties. While most known gold mineralization occurs in quartz veins hosted within the metavolcanic rocks or at the granite–greenstone contact, past drilling (DDH ME-87-04 and ME-88-113) has demonstrated economic gold grades in veins hosted by altered granitic (leucotonalite) rocks (Resident Geologist's Files, Thunder Bay South District, Thunder Bay). Further exploration of the granitic rocks is warranted.

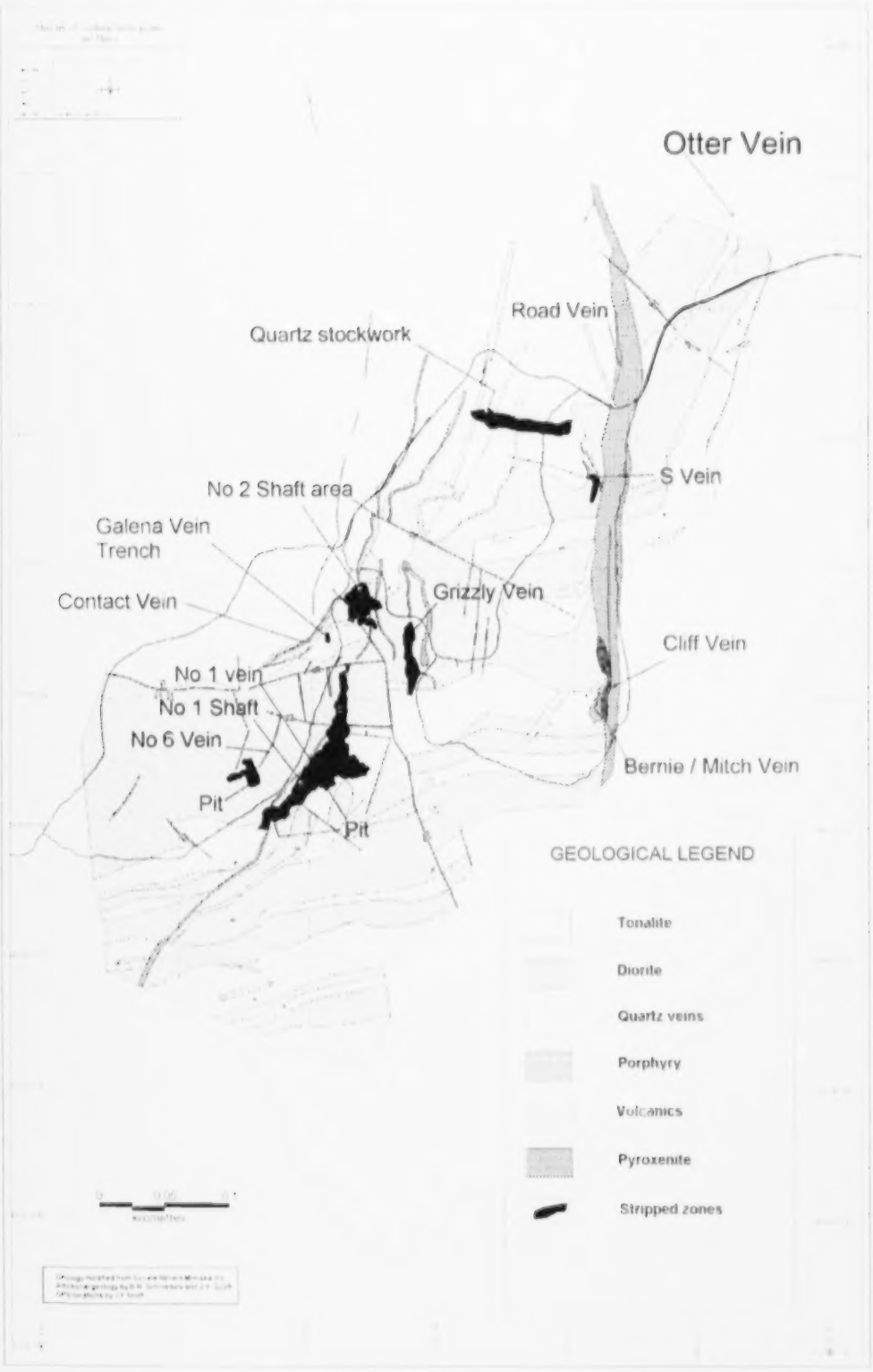

Figure 3. Geology of the Elizabeth Mine property.

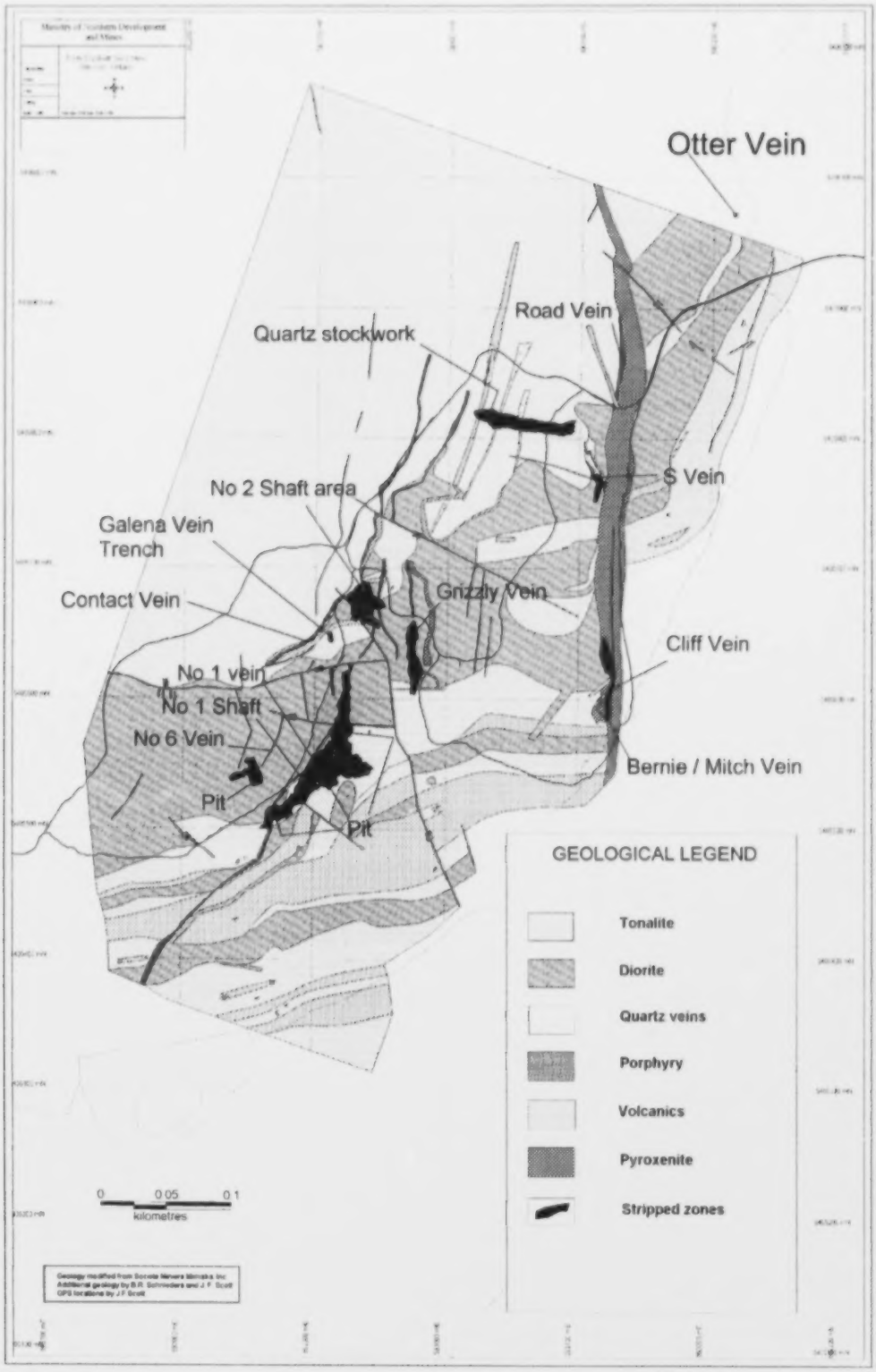

Figure 3. Geology of the Elizabeth Mine property.

RECOMMENDATIONS FOR EXPLORATION

Gold and Base Metal Potential in the West-Central Shebandowan Greenstone Belt

The west-central Shebandowan greenstone belt is a portion of the Wawa Subprovince. Past producers include the Inco Shebandowan Ni-Cu-PGE mine (8.6 Mt @ 2.0% nickel, 1% copper and 2.68 g/t platinum+palladium), the North Coldstream Cu-Ag-Au mine (2.7 MT recovering 102 million pounds copper (~1.89% copper), 440 000 ounces Ag and 22 000 ounces gold) and the Ardeen gold mine (~30 000 ounces gold). The west-central Shebandowan belt hosts numerous prospects for both gold and base metals including

1. Ardeen Mine (Pele Mountain Resources Inc.) with an inferred resource of 1 082 939 T @ 14.4 g/T gold;
2. East Coldstream (Alto Ventures Ltd.) with a resource of 7.6 Mt @ 2 g/t gold;
3. Pistol Lake–Frank West (D. Parker and B. D'Silva) with a resource of 2.9 Mt @ 2.6 g/t gold;
4. Snodgrass Lake (Moss Lake Gold Mines Ltd.) with a resource of 60 mt @ 1.1 g/t gold, including measured and indicated resources of 475 000 T @ 6.2 g/t gold;
5. Swamp River (Band-Ore Resources Ltd.–Balsam Ventures Inc.) including the Main zone with a resource of 706 000 t @ 6.86 g/t gold and the No. 4 zone with resources of 616 000 t @ 4.83 g/t gold; and
6. East and West Vanguard (Canadian Golden Dragon Resources Ltd.) with resources of 100 000 T @ 1.8% copper, 3.4% zinc, 0.22 ounce per ton silver and 0.06 to 0.19 ounce per ton gold and 200 000 T @ 1.3% copper, 1 to 2% zinc and 0.28 ounce per ton silver, respectively (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

Note: The resource estimates listed above do not follow the required disclosure for reserves and resources as outlined in National Instrument 43-101, and are historic resource figures generated by past workers.

GOLD

Gold is associated with 5 mineral deposit models (examples of occurrences are listed):

1. Quartz and quartz-carbonate veins mineralized with pyrite, chalcopyrite, galena, sphalerite and telluride emplaced within or adjacent to shear zones in mafic to intermediate metavolcanic and metasedimentary rocks (e.g., Ardeen Mine, Minoletti zone, Beaver, Fisher Lake, Larose, Sungold, Redfox).
2. Sheared and fractured quartz-phyric felsic flows, or early porphyry sills, and in diorite to gabbro, quartz-feldspar and feldspar porphyry bodies emplaced within metavolcanic and metasedimentary sequences (e.g., Snodgrass Lake, Span Lake, East Coldstream, Pistol Lake, Swamp).
3. Banded iron formation units mineralized with pyrite and chalcopyrite (e.g., Pearce Lake, Ardeen Mine, Fisher and 2 km west of Burchell Lake).
4. Quartz and quartz-carbonate veining, with associated silicification, iron-carbonate alteration, and pyrite, chalcopyrite, arsenopyrite mineralization emplaced within, or spatially associated with, brittle-ductile shearing (e.g., Shebandowan West, East Coldstream).
5. Base metal mineralization (mainly Cu, Zn), including volcanogenic massive sulphide (VMS), chert-exhalative and structural and/or shear zone-related base metals. In some cases, gold may represent a late overprint (e.g., North Coldstream, Vanguard (East, Central, West zones) Tilly Creek) (revised from Osmani 1997).

Recent exploration by prospectors and junior exploration companies has led to the discovery of numerous new gold occurrences in the west-central Shebandowan greenstone belt. Prospecting and exploration by R. Kwiatkowski and Freewest Resources Canada Inc. has led to the discovery of the Larose occurrence. Preliminary stripping and sampling has exposed a number of *en échelon* shear zones within metasedimentary rocks (wacke and siltstone), that have been intruded by quartz-feldspar porphyry dikes and sills. Gold mineralization occurs in silicified, sericitized, carbonatized, hematitized and sulphidized shear zones along a 1.9 km strike. Mineralization includes galena, sphalerite, chalcopyrite, pyrite, arsenopyrite and visible gold. Grab samples of up to 371 g/t gold (10.85 ounces per

ton gold), collected by Freewest, have been reported (*Manitouwadge Echo*, August 13, 2003). Grab samples collected by the author assayed as high as 228 g/t gold, 72 g/t silver, 5.2% lead and 3% zinc, and numerous multi-ounce gold assays were reported from grab samples of sheared, silicified and sulphidized metasedimentary rocks. The Larose occurrence occurs northwest of the Boundary fault, within under-explored metasedimentary rocks considered by many to represent Quetico-type metasedimentary rocks. Investigations by MNDM staff have identified metavolcanic rocks and possible thrust-stacked sequences within the metasedimentary rocks. The Larose and Tilly Creek occurrences (Cu-Ag-Au-mineralized veins within sheared metasedimentary rocks) represent new exploration targets along a more than 30 km strike length, from McKenzie Lake in the southwest to east of Ames Township in the northeast. Major faults, such as the Boundary fault, Burchell Lake–Knife Lake fault, Snodgrass Lake fault and Squeers Lake–Greenwater Lake fault, have trends parallel to many gold-mineralized zones (e.g., Sungold, Larose, Ardeen, East Coldstream, etc.), and may represent permeability or plumbing systems for gold mineralization.

Gold mineralization has recently been discovered associated with a quartz-carbonate stockwork along the western extension of the Vanguard "chert exhalative" horizon. Several styles of gold mineralization are present, including flat and vertical quartz-carbonate veins adjacent to a chert exhalite, which yielded 11.3 and 6.27 g/t gold from grab samples (Canadian Golden Dragon Resources Ltd., press release, September 25, 2003). The chert horizon contains pyrite and chalcopyrite and assayed up to 1 g/t gold. A carbonatized, magnetite-bearing dike(?) parallels the chert-exhalative horizon, and where cut by quartz-carbonate-pyrite veins assayed 16.5 g/t gold (Canadian Golden Dragon Resources Ltd., press release, September 25, 2003).

BASE METALS

Base metals are associated with 3 mineral deposit models (examples of occurrences are listed):

1. VMS and stratigraphically controlled base metal occurrences (e.g., North Coldstream Mine, Vanguard (East and West), Valvsasori, Hermia Lake, Whalen and Track occurrences)
2. Intrusion-hosted base metal occurrences (e.g., Powerline, Highway 11)
3. Structurally controlled base metal mineralization (e.g., Haines Gabbro, NW Peninsula, Copper Island) (Farrow 1994)

Recent exploration by Canadian Golden Dragon Resources Ltd. has identified a potential copper-mineralized, chert exhalite-stringer zone with a potential strike length of more than 10 km, extending from east of the Vanguard occurrences to the North Coldstream Mine in the west. The deposit model for the North Coldstream Mine has long been problematical, as mineralization and alteration features do not fit any single model. Base metal deposit models range from VMS or stratigraphically controlled, to magmatic and intrusion hosted, to structurally controlled. The North Coldstream Mine may represent a structurally deformed and remobilized Cu-Ag-Au chert exhalite unit, part of a major VMS event in the west-central Shebandowan belt. In addition, the Vanguard deposits (East and West) may represent more distal (Zn-Cu-Au) and structurally offset portions of the same VMS system. The base metal-mineralized chert exhalite horizon has undergone structural modification and remobilization along a major northeast-trending structural corridor. Limited research on deposit models and mineralization has been completed in the west-central Shebandowan belt, and further work is warranted. The felsic metavolcanic rocks from Powell Lake in the west to Kabigon Lake in the east, represent a 60 km long potential exploration target with numerous base metal and gold occurrences. Felsic pyroclastic rocks and "chert exhalite", representing a potential felsic centre and flow dome have been noted in the immediate Burchell Lake and Whitefish Lake areas.

The west-central Shebandowan greenstone belt has excellent exploration potential for both gold and base metals. With a history of metal production and a host of known resources, this belt remains under explored and poorly researched. Gold mineralization associated with felsic intrusive rocks requires further exploration, including underexplored metasedimentary rocks, formerly thought to represent metasedimentary rocks of the Quetico Subprovince. In addition, major zones of carbonatization and quartz veining, related to structural deformation, remain excellent gold exploration targets. Base metal exploration should include stratigraphic, structural and lithogeochemical mapping to unravel complex relationships and further delineate mineral deposit models. Recent logging and road development has provided new access to much of the belt and further prospecting and exploration is warranted.

Prairie River Area

The Prairie River area (alternate names: Steel River, Santoy Lake, Prospect Lake, McKellar Lake, Spider Lake, Granite Mountain properties or Jackfish area) has been a focus for base metal exploration since the 1950s. The area has been recommended numerous times in past years (Patterson et al. 1985; Schnieders et al. 1993; Schnieders and Smyk 1994; Schnieders and Smyk 1995; Schnieders et al. 1999). Geological information continues to be added to the puzzle, supporting the exploration and potential discovery of a base metal deposit in the Prairie River area. Listed below are 10 "pieces of the puzzle" and evidence that supports this recommendation:

1. The Prairie River area hosts a number of base metal occurrences that occur within an east-trending package of metavolcanic and metasedimentary rocks over a distance of approximately 10 km, from east of Santoy Lake to McKellar Lake and Dead Horse Creek. The polymetallic occurrences include the following :
   - **Starhill** (8.70% zinc, 2.23% copper, 0.46% lead, 1.7 ounces per ton silver and 0.02 ounce per ton gold);
   - **Prairie West** (20.25% zinc, 3.78% copper, 0.04% lead, 1.60 ounces per ton silver and 0.04 ounce per ton gold);
   - **Marlhill** (1.04% zinc, 0.04% copper and 2.8 g/t silver across 11 m; and 0.52% zinc across 42.5 m);
   - **Bozena Lake North** (13.24% zinc, 0.11% copper across 3.35 m; and 11.48% zinc and 6.16% copper from a grab sample);
   - **Bozena Lake South** (0.98% zinc, 0.53% copper across 2.11 m);
   - **Crush** (5.7% copper, 0.15% zinc, 75.2 ppm silver and 375 ppb gold);
   - **Goldbar Lake** (0.98% zinc, 4.73% copper, 80.1 g/t silver and 0.76 g/t gold across 1.1 m);
   - **MacKellar Bay** (13% zinc, 7.14% lead, 824 g/t silver);
   - **Alvey** (0.07% zinc, 1.55% lead, 36 g/t silver);
   - **Dead Horse Creek veins** (35 000 T @ 19.87% lead, 9.08% zinc and 27.65 ounces per ton silver) (Resident Geologist's Files, Thunder Bay South District, Thunder Bay)
2. Field evidence supports a volcanic–hydrothermal centre in the Spider Lake–Granite Mountain area, including sulphide-bearing ("pregnant"), garnetiferous, felsic pyroclastic rocks ("mill rock") (Schnieders et al. 1993). This is a classic volcanogenic massive sulphide (VMS) setting and is likely related to a higher temperature system (J.M. Franklin, personal communication, 2002). Felsic metavolcanic rocks associated with VMS deposits at Winston Lake and Manitouwadge have ages of approximately 2720 Ma. The Prairie River area has been interpreted by the authors to display a similar geological setting to that of Winston Lake and Manitouwadge.
3. Locally pervasive hydrothermal alteration has been identified in the host rocks, including a broad, east-trending sodium (Na_2O <2%), and calcium depletion zone, as well as potassium, iron, magnesium, copper and zinc enrichment. A zone of sodium depletion envelops the base metal occurrences, and extends east to the MacKellar Bay occurrences and west to Santoy Lake. In the vicinity of many of the base metal showings, and especially near a geologically and geophysically interpreted fold and fold axis, the host rocks have been altered and deformed to produce distinctive, sericite-chlorite-biotite±carbonate±garnet schists. Chloritoid and cordierite have also been noted. Sericitization, chloritization, silica-filled fractures and fine quartz veins have been described (Resident Geologist's Files, Thunder Bay South District, Thunder Bay). A 10 km long, potassium radiometric anomaly is also present on an airborne survey conducted by the Geological Survey of Canada in 1990 (Hetu and Ford 1992).
4. This portion of the Schreiber–Hemlo greenstone belt, mapped by Walker (1967), consists predominantly of amphibolite-facies, intermediate to felsic metavolcanic rocks, mainly andesite, rhyolite, associated pyroclastic rocks and iron formation. The package has been intruded by gabbro and diabase. A large, east-closing tight to isoclinal fold is inferred by Walker (1967) and supported by regional geophysics, as described in section #3. A sulphide-facies banded iron formation (BIF) delineates the fold, and marks a major contact between metasedimentary and metavolcanic rocks; the BIF generates a strong, relatively continuous, "formational conductor".

5. Numerous lake bottom sediment anomalies are present in the area (Dyer 1997). Dyer (1997) described the Prospect Lake area (Area 8; north limb of fold) as a Cu, Zn, ±Pb, ±Au, ±Hg, ±LREE anomaly. The geology consists of felsic metavolcanic rocks with minor, intercalated mafic metavolcanic rocks, metasedimentary rocks (including iron formation), minor gabbro-diorite and granite (aplite). On the south limb of the fold, Dyer (1997) recommended the Spider Lake (Area 21; south limb) area Cu, Zn ±Mo anomaly as an exploration target. The Prairie River area displays a cadmium enrichment, similar to the Winston Lake area. Starhill Lake sediments are enriched in zinc, silver, cadmium and mercury, and have elevated lead values (Dyer 1997). Silver is also enriched in numerous lake sediments in the Santoy Lake to Dead Horse Creek area. Prospectors J. Courtney and G. Daniels collected a soil sample on their Fire Mountain property (located south of Starhill Lake and south of the southern iron formation) that assayed 2623 ppm Zn (Schnieders and Smyk 1994). An anomalous zinc zone over 100 m wide and over a 7 km in strike length is located east of Prospect Lake to Bozena Lake (Assessment Files, Thunder Bay South District, Thunder Bay).

6. Numerous geophysical anomalies have been identified in the area. These include a 1200 m long induced polarization (IP) anomaly, as well as formational conductors associated with sulphidic and graphitic zones. Numerous electromagnetic (EM) targets have been drill tested. A steeply plunging, zinc-rich, VMS deposit would likely have a poor EM signature, especially if it was flanked or masked by a graphitic or pyritic conductors. Field evidence supports a multiphase deformation history with at least 2 periods of folding. Mineralized zones could be steeply dipping, rods, pods and/or lenses. A UTEM geophysical survey conducted by Noranda Exploration Co. Ltd. over the Marlhill and Prairie West occurrences to the east suggested "increased conductivity at depth" on line 18W and another anomaly on line 24W closer to the Starhill property (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

7. Many of the showings (Starhill, Prairie West, Marlhill and Goldbar) consist of stringer and disseminated sulphide mineralization, possibly representing deformed stringer zones or sulphides that have been remobilized along axial-planar cleavage. Higher grade copper mineralization is present at the Bozena Lake North, Crush, Goldbar Lake and Prairie West occurrences. Higher-grade zinc mineralization is present at Prairie West, Bozena Lake North and Starhill, as well as at the MacKellar Bay and Dead Horse Creek veins. The Bozena North occurrence is described as

> ...sphalerite mineralization occurring in quartz and carbonate veins associate with 190 degree striking fractures, as well as conjugate structures. The mineralization is hosted by felsic pyroclastic rocks and minor metasedimentary interbeds. Approximately 28 m south of the main Bozena showing, a pit was opened which exposed highly rusted altered felsic volcanics and graphitic argillite. Although the rock did not display clearly evident sulphide mineralization other than the rusty alteration, a grab sample yielded 2.52% Zn. (Resident Geologist's Files, Thunder Bay South District, Thunder Bay)

   The Bozena Lake North intersection has also been interpreted to represent a down-dip intersection of a quartz-carbonate vein (Resident Geologist's Files, Thunder Bay South District, Thunder Bay). Surface stripping led to another interpretation that the zone represents a tectonically reactivated, stringer or crackle zone in a VMS model (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

8. The Dead Horse Creek and the MacKellar Bay zinc-lead-bearing and silver-bearing veins are interpreted by the authors to represent Proterozoic remobilization and re-concentration from the main Prairie River volcanic assemblage. The vein mineralization event was likely related to the emplacement of the Mesoproterozoic Port Coldwell alkalic complex, located immediately to the east.

9. Iron formation represents a marker horizon that can be followed around the entire fold closure (i.e., more than 20 km in strike length). The iron formation is described by Walker (1967) as having "three main types": 1) chert, 2) sugar and ribbon quartz, and 3) siliceous, graphitic schist. The predominance of sulphides over magnetite in these rocks and the occurrence of graphite in the associated schists suggest a strongly reducing depositional environment (Walker 1967). The iron formations are enriched in zinc at several locations (e.g., Bozena Lake) and this marker horizon should be thoroughly sampled.

10. The felsic metavolcanic package, between Santoy and Goldbar lakes, falls within the FIII classification for felsic metavolcanic rocks (Lesher et al. 1986). FIII felsic rocks have been associated with productive VMS camps (Resident Geologist's Files, Thunder Bay South District, Thunder Bay).

Magnetic Anomaly: Northeastern Goldie Township

Recent logging activity has provided access to an unexplained circular magnetic anomaly (Ontario Geological Survey 2003) in the area near the northeast corner of Goldie Township, Thunder Bay District. This anomaly also encompasses the northwest corner of Forbes Township, as well as a portion of Abitibi Block 1. The anomaly is characteristically ring-dike like in appearance.

Access to the area is best achieved by using the former Canadian National Railroad right-of-way, which has been converted to a road. This right-of-way can be either accessed from the south near Finmark or from the north via the Camp 236 Road. The Camp 236 Road intersects the Trans-Canada Highway (Highway 17), 5.5 km south of Raith.

The area was mapped for the Ontario Geological Survey by M.W. Carter in the summer of 1984. Carter (1990a, 1990b) describes the area to be underlain by clastic metasedimentary rocks that have been intruded by syenite with melanocratic phases. A cursory examination during October 2003 confirmed the presence of mafic intrusive rocks. No samples were taken at the time.

A circular topographic feature matches the location and shape of the magnetic anomaly. The ring-dike nature of the anomaly is apparent. This anomaly should be prospected for copper-nickel-platinum group metal mineralization. There are copper-nickel-platinum group metal occurrences in the area; the most notable one, the Hackl occurrence, is on Highway 17 approximately 12 km to the northwest.

Figure 4 depicts the location, as well as other features such as topography and magnetics, of this anomaly.

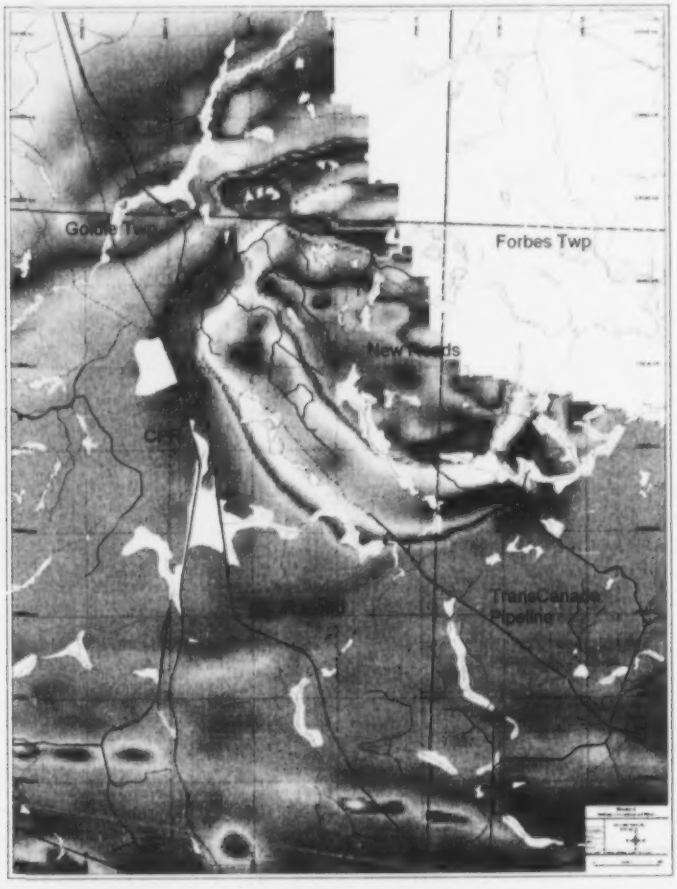

Figure 4. Illustrating the magnetic anomaly in northeastern Goldie Township.

Magnetic Anomaly: Northeastern Goldie Township

Recent logging activity has provided access to an unexplained circular magnetic anomaly (Ontario Geological Survey 2003) in the area near the northeast corner of Goldie Township, Thunder Bay District. This anomaly also encompasses the northwest corner of Forbes Township, as well as a portion of Abitibi Block E. The anomaly is characteristically ring-dike like in appearance.

Access to the area is best achieved by using the former Canadian National Railroad right-of-way, which has been converted to a road. This right-of-way can be either accessed from the south near Dinorwic or from the north via the Camp 236 Road. The Camp 236 Road intersects the Trans-Canada Highway (Highway 17), 5.5 km south of Raith.

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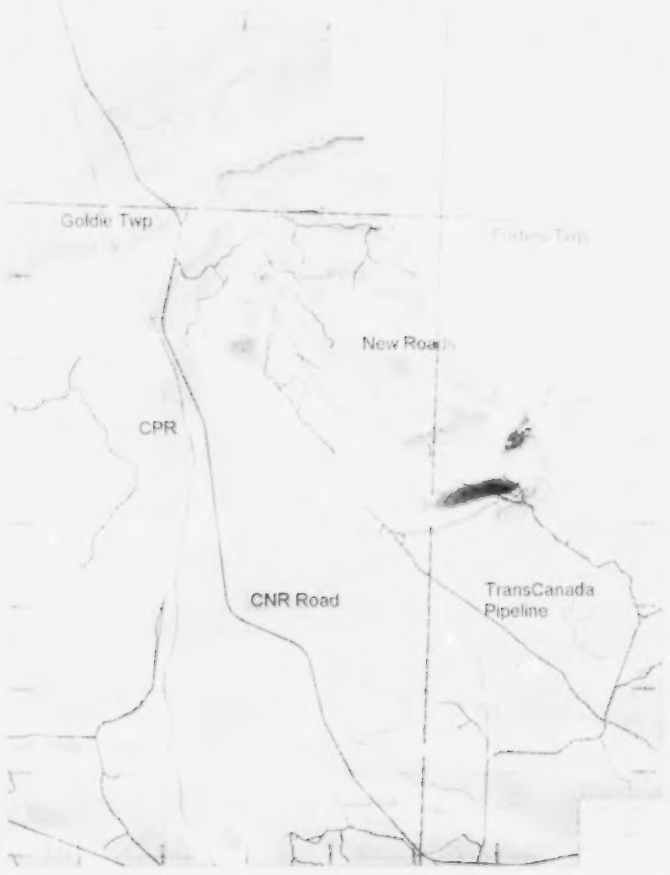

Figure 4. Illustrating the magnetic anomaly in northeastern Goldie Township.

Fitzpatrick Lake Pegmatite

A large pegmatite dike was discovered in the Fitzpatrick Lake area during the fall of 2003. The estimated exposed dimensions of this dike are in excess of 130 m long, 40 m wide, and at least 15 m deep. The depth estimate was based on the fact that the dike is exposed along a scarp.

Access is via the Escape Lake Road, which intersects Highway 527 near kilometre 17. Go east on this road for about 8.5 km and then take a logging road north until you reach a point where the water crossing has been removed. Then continue by foot or all-terrain vehicle for about 2.6 km until you are on top of a small hill. The dike is situated on the north side of the skidder trail at the highest point of the rise. A large logged out area is exposed north off the dike. The entire north flank of the dike is exposed along the scarp that forms the north side of the hill. Figure 5 depicts the location of this dike.

This dike appears to be similar in mineralogy to those dikes along the Highway 527 corridor, but is considerably larger. Large potassium feldspar crystals, some up to 60 cm across, are exposed along the smoothed glaciated surface. Perthitic feldspar, muscovite, and quartz are present as the major constituents. No detailed investigation was done at the time of discovery. No samples were taken. The dike should be sampled and evaluated for rare-metal pegmatite mineralization including tantalum and cesium.

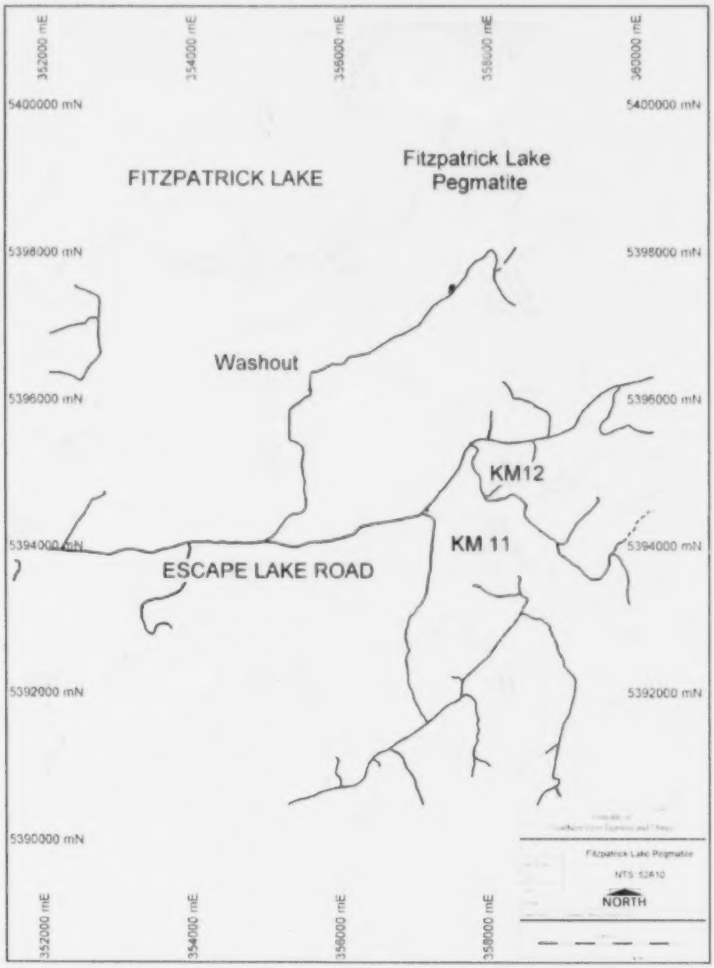

Figure 5. Location of the Fitzpatrick Lake pegmatite.

OGS ACTIVITIES AND RESEARCH BY OTHERS

1. Denver Stone, Precambrian Geoscience Section, OGS, carried out mapping in the south-central Wabigoon Subprovince, near Upsala (Stone et al. 2003a, 2003b, 2003c). This work was an extension of previous mapping projects in the Ignace–Atikokan area that studied the origin and relationships between Mesoarchean and Neoarchean rocks, as well as regional controls on mineralization. Regional-scale mapping reassessed the mafic and ultramafic intrusions in the Lac des Iles area, with several intrusions (Wakinoo, Legris, Camp Lake) being part of a large batholith of the sanukitoid suite.

2. Tom Hart, Precambrian Geoscience Section, OGS, mapped in the area between northern Black Sturgeon River and Disraeli Lake, south of Lake Nipigon. This area is underlain by Mesoproterozoic ultramafic intrusions, Nipigon diabase sills, and Sibley Group sedimentary rocks, as well as Archean metasedimentary and felsic intrusive rocks of the Quetico Subprovince located to the east of the interpreted Black Sturgeon fault. This project will also include interpretation of igneous petrogenesis, stratigraphic analysis, and the development of geological cross-sections, to be undertaken in co-operation with researchers at Lakehead University. Initial examination indicates that the ultramafic intrusive rocks intrude the Sibley Group sedimentary rocks and have a geochemically distinctive monzogabbro phase near the contacts, indicative of at least minor assimilation of the country rocks. Nipigon diabase sills intrude both the ultramafic rocks at both Seagull and Disraeli lakes, providing a relative age relationship for the Mesoproterozoic rocks. East of the Black Sturgeon River in the Quetico Subprovince, pegmatitic, muscovite leucogranite dikes with graphic intergrowth textures indicative of fertile granites that have the potential to host rare-element mineralization (Breaks, Selway and Tindle 2003). Hematite alteration is common in both Archean and Proterozoic rocks associated with north-trending structures. However, the origin of the hematite is not clear at this stage and further work is required to understand the timing and number of hematite alteration events and their metallogenic significance.

3. Jay Jackson, formerly of the Sedimentary Geoscience Section, OGS, carried out high-density lake sediment and water geochemical surveys of the Dayohessarah Lake area that identified 22 discrete anomalous areas. The geochemical surveys generated new targets for potential precious and base metal mineralization in the Dayohessarah area (Jackson 2003).

4. The Lake Nipigon Region Geoscience Initiative (LNRGI) is a two-year $3.5 million geoscience project managed by the Ontario Prospectors Association. The project area is approximately 22 000 km^2 covering the region around western Lake Nipigon. Project activities include geological mapping (3340 km^2); airborne geophysical surveys (49 400 line km at 150 m flight lines); ground gravity survey (3600 station, 1 km spacing); surficial geochemistry case studies (5 areas); Lakehead University studies (3 projects); geochronology (20 new ages); drill core recovery and storage; and GIS compilation of legacy data (22 000 km^2).

   Currently, the project is in the second year. The airborne magnetic and gamma-ray spectrometry survey is complete with data release scheduled for April 2004. As of December 31, 2003, $1.5 million has been invested in the above-mentioned projects.

5. Under the supervision of Keiko Hattori, PhD candidate John Hinchey (University of Ottawa) is documenting the geology of the palladium mineralization in the South Roby and Twilight zones to establish the paragenesis and to examine the genesis of the mineralization in the main zones at the Lac des Iles Mine. The focal question remains the cause of high palladium relative to other platinum group metals and the possible role and scale of hydrothermal activity in the concentration of palladium. The major goal of the thesis is to answer the ongoing debate of the origin of the deposit, thought to be primarily magmatic or hydrothermal.

6. Under the supervision of Keiko Hattori, MSc candidate Mike Fell (University of Ottawa) is currently studying the petrology and mineralization in the Baker zone at the Lac des Iles Mine. The major goal of the thesis is to discern the intrusive relationships and timing of events in this area. Comparisons may be made to the nearby Roby zone.

7. PhD candidate Tafdza Gomwe (l'Université du Québec à Chicoutimi) is currently working on research in the Roby and Twilight zones.

8. As part of Operation Treasure Hunt, airborne magnetic and electromagnetic surveys of the Garden–Obonga and Schreiber areas were completed by the OGS and 1:50 000 maps were produced.

9. P. Hollings (Lakehead University) studied the geology and geochemistry of the Slate Islands and the Lac des Mille Lacs greenstone belt.

10. Faculty and students at Lakehead University, Thunder Bay, have recently been, or are currently involved in a number of research projects in the Thunder Bay District:

    BSc (Hons.) Theses

    - Hallé, J. Paleomagnetism and magnetic fabrics of mafic intrusions in the Quetico belt near Atikokan
    - Heerema, D. Fluid inclusions in pegmatitic phases of the Lac des Iles complex
    - Kelso, I. Geology and fluid inclusion studies on the Thunder Bay Agate Mine
    - Richardson, A. Pass Lake formation sediment provenance

    MSc Theses

    - Heggie, G. Geochemistry and mineralization of the Seagull deposit, Northern Ontario
    - Muric, M. Sandstone architecture of the Paleoproterozoic Rove and Virginia formations, western Lake Superior region
    - Metsaranta, R. Paleohydrology of the Mesoproterozoic Lower Sibley Group, Northwestern Ontario
    - Richardson, A. Geochemical variation within the Mesoproterozoic Nipigon Diabase
    - Rogala, B. The Sibley Group: a lithostratigraphic, geochemical and paleomagnetic study

    Publications

    - Burton, J.P. and Fralick, P.W. 2003. Depositional placer accumulations in coarse-grained alluvial braided river systems; Economic Geology, v.98, p.985-1001.
    - Fralick, P.W. 2003. Geochemistry of clastic sedimentary rocks: ratio techniques; Geological Association of Canada, GeoTEXT 4, p.85-103.
    - Pufahl, P.K. and Fralick, P.W. in press. Depositional controls on Paleoproterozoic iron formation accumulation, Gogebic Range, Lake Superior Region; U.S.A. Sedimentology.

A complete listing of publications received in the Thunder Bay South District office in 2003 is included in Table 5. Properties not currently being mined in the district are listed in Table 6.

Table 5. Publications received by the Thunder Bay South Resident Geologist's Office in 2003.

Title	Author(s)	Type and Year of Publication
Dayohessarah Lake Area High Density Regional Lake Sediment and Water Geochemical Survey, Northeastern Ontario	J.E. Jackson	Open File Report 6103, Miscellaneous Release—Data 116 (Ontario Geological Survey 2003)
Nipigon Bay, Airborne Geophysical Survey: Operation Treasure Hunt	Purchased Data	Airborne Magnetic and Electromagnetic Survey Maps (1:50 000), Maps 60104 to 60106 (Ontario Geological Survey 2003)
Nipigon Bay, Airborne Geophysical Survey: Operation Treasure Hunt	Purchased Data	Geophysical (GDS) Data Set 1226 (Ontario Geological Survey 2003)
Schreiber, Airborne Geophysical Survey: Operation Treasure Hunt	Purchased Data	Geophysical (GDS) Data Set 1104a-d(rev) (Ontario Geological Survey 2003)
Garden–Obonga, Airborne Geophysical Survey: Operation Treasure Hunt	Purchased Data	Geophysical (GDS) Data Set 1105a,b,d (rev) (Ontario Geological Survey 2003)
Ignace Survey Area High Density Regional Lake Sediment Geochemical Survey, Northwestern Ontario: Operation Treasure Hunt	J.E. Jackson	Open File Report 6106, Miscellaneous Release—Data 118 (Ontario Geological Survey 2003)
Preliminary Report of Field Descriptions and Contact Relationships of Lithological Units in the South Roby and Twilight Zones, Lac des Iles Deposit, Northwestern Ontario	J. Hinchey, K.H. Hattori and M.J. Lavigne	Open File Report 6107 (Ontario Geological Survey 2003)
Regional Geology of the Lac des Iles Area, Summary of Field Work and Other Activities 2003	Stone, D., Lavigne, M.J., Schnieders, B., Scott, J., Wagner, D.	Open File Report 6120 (Ontario Geological Survey 2003)
Report of Activities 2002, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	B.R. Schnieders, J.F. Scott, M.C. Smyk and M.S. O'Brien	Open File 6112 (Ontario Geological Survey 2003)
Precambrian Geology, Upsala Area	D. Stone, M. Fell and R. Metsaranta	Map P.3530 (1:50 000) (Ontario Geological Survey 2003)
Precambrian Geology, Lac des Iles Area	D. Stone, M. Fell, A. Daley, B. Schnieders, J. Scott, P. Nielsen and D. Wagner	Map P.3532 (1:50 000) (Ontario Geological Survey 2003)

Table 6. Mineral deposits not being mined in the Thunder Bay South Resident Geologist's District in 2003.

Abbreviations

AF ..... Assessment Files
CMH ..... *Canadian Mines Handbook*
GR ..... Geological Report
MDC ..... Mineral Deposit Circular
MDIR ..... Mineral Deposit Inventory record
MLS ..... Mining Lands, Sudbury
MR ..... Mining Recorder
NM ..... *The Northern Miner*
OFR ..... Open File Report
PC ..... Personal Communication

Deposit Name and NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Anderson Lake 52A/10NE	Mo	1 346 000 T (grade not stated)	Open for staking	W.N. Ingham (16/06/59) in Prospectus, Lindsay Explorations Ltd. (19/06/59)	Inactive
Ardeen Mine 52B/10SE,SW	Au	90 650 T @ 15.3 g/T Au (uncut) [84 904 T @ 11.6 g/T Au, assays cut to 2 oz Au /t]; inferred resource of 1 082 939 T @ 14.4 g/T Au (uncut) [991 739 T @ 11.2 g/T Au, assays cut to 2 oz Au /t]	Pele Mountain Resources Inc (CMH 2002-2003, p.335)	The Ontario Prospector, v.1, no.3, p.35 (1998); CMH 2002-2003, p.335	Over $2 M spent in exploration since acquisition in 1996; diamond drilling in 2003
Atikokan Iron Mine 52B/14	Fe, Cu	12 000 000 T @ 35% Fe, 0.040% Cu	K. Bjorkman (Resident Geologist's Files)	NM (26/10/72)	Inactive
Aumacho (Brink) 42E/05SW	Li	759 475 T @ 1.65% Li_2O, plus 96 000 T @ 1.5% Li_2O	A. Hayes (Resident Geologist's Files)	GR 31, p.64 (1965)	Active; VLF-EM survey conducted in 1995
Coco–Estelle 42E/03SW	Au	53 700 t @10.7 g/t	J. Bond et al. (Resident Geologist's Files)	AF	Optioned to Tri-Alpha Investments Ltd. in 2003
Coldstream 52B/10SE	Au	7.6 Mt @ 2 g/t Au	Alto Ventures Ltd. (News Release, October 01, 2002)	Alto Ventures Ltd. (News Release, October 01, 2002)	Drilled by Noranda and Freewest 1990/1991; acquired from The Other Mining Company (U.S.) Inc. in 2002
Conway 52H/08NE	Li	1.83MT @ 0.96% Li_2O to 300 m	E.S. Conway (Resident Geologist's Files)	GR 31, p.68 (1965)	Inactive
Coubran Lake 42D/16NW,SW	Cu, Fe, Ti, P	60 MT @ 0.2% Cu, 27% Fe, 5% Ti, 5% P; plus 32 MT @0.3% Cu, 23% Fe, 0.02% Ni, 2.48%Ti, 0.36% P	Newmont Mining Corporation of Canada Limited (Newmont Capital) (CMH 2002-2003, p.170)	AF (F.N. 2.14737; 1991)	87 leases and additional claims acquired from acquisition of Redstone Resources Inc. and Franco-Nevada; optioned to Aurogin Resources Ltd.
Dead Horse Creek North 42D/15SE	Pb, Zn, Ag	14 000 T @ 1.45% Pb, 7.28% Zn, 8.27 opt Ag	G. and W. Michano (2 of 8 original patented claims); remainder open for staking (Resident Geologist's Files)	Resident Geologist's Files	Inactive

Deposit Name and NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Dead Horse Creek South 42D/15SE	Pb, Zn, Ag	35 000 T and 36 000 T (Zones 1 and 2) @ 19.87% Pb, 9.08% Zn, 27.65 opt Ag	J. McCabe (Resident Geologist's Files)	Resident Geologist's Files	Inactive
Dorion Mine 52A/15	Pb, Zn	Maximum of 35 000 T @ 10% Pb	K. Haskell (Resident Geologist's Files)	Prospectus, Andowan Mines Ltd. (30/03/57)	Restaked by current holder in 2002
Elizabeth Mine 52B/13SE	Au	250 000 tons @ 4.57 g/t Au	R. Moffatt (Resident Geologist's Files)	CMH, 1998-99, p.309	Inactive
Geordie Lake 42D/16SW	Cu, Ag, Pd	Indicated 24.4 Mt @ 0.33% Cu, 0.54 g/t Pd, 2.52 g/t Ag	L.E.H. Ventures Ltd. (CMH 2002-2003, p.247)	CMH 2002-2003, p.247	Drilling continuing in 2003
Great Lakes Nickel 52A/4SE	Cu, Ni, PGE	45.6 MT @ 0.344% Cu, 0.183% Ni; Pt & Pd values	Great Lakes Nickel Limited (CMH 2002-2003, p.197)	CMH 2002-2003, p.197	1970's bulk sample and feasibility study
Hammond Reef 52B/14NW	Au	85 mt @ 0.93 g/t Au (= 2.56 million oz Au)	Kinross Gold Corporation (CMH 2002-2003, p.336)	News release, Pentland Firth Ventures Ltd., 1997	1997: drilling, channel sampling and inventory calculation
Heinlo (Interlake) 42C/12NW	Au	10.8 M tons @ 0.216 opT Au (= 2 328 000 oz Au)	Newmont Mining Corporation of Canada Limited (Newmont Capital) (CMH 2002-2003, p.170)	First-Quarter Report, Franco-Nevada Mining Corporation Limited, 1999	Advanced exploration drifting and underground diamond drilling 1998-1999
Jack Lake 52B/14SW	Au	Possible: 75 000 T @ 0.35 opT Au and 3000 T @ 0.30 opT Au[1]; or 100 000 T @ 0.45 opT[2]	M. Wicheruk (Resident Geologist's Files)	[1]OFR 5332, p.J-7 (1981) [2]Annual Report, Asamera Inc. (1981)	Inactive
Jean Lake 42E/05NW	Li	1.689 MT @ 1.30% Li_2O	Golden Nugget Exploration Inc. (CMH 2002-2003, p.190; Resident Geologist's Files)	Jean Lake Lithium Mines Ltd., Annual Report (1957)	Inactive
Lac La Croix 52B/05SW	Li	1.525 MT @ 1.27% Li_2O	Within Quetico Provincial Park	AF	Mining Lease of Occupation expired in 1970
M.N.W. 52H/04NE	Li	40 000 T "high-grade Li"	Golden Nugget Exploration Inc. (CMH 2002-2003, p.190; Resident Geologist's Files)	Geological Survey of Canada, Economic Geology Report 21, p.61 (1965)	Option to earn 70% interest granted to Platinova A/S in 2001 (CMH 2001-2002, p.296)
Marathon prospect 42D/16SW	Cu, Ni, PGE	21 261 000 t measured and indicated resources grading 1.32 g/t Pd, 0.34 g/t Pt, 0.12 g/t Au, 0.40% Cu	Polymet Mining Corp. (CMH 2002-2003, p.344)	Geomaque Explorations Ltd., press release, October 16, 2001	Property sold to Marathon PGM Corporation (Polymet Mining Corp. press release, January 15, 2004)
McVittie 52H/08NE	Li	261 000 T @ 1.03% Li_2O	Golden Nugget Exploration Inc. (CMH 2002-2003, p.190; Resident Geologist's Files)	GR 31, p.89 (1965)	Inactive
Nama Creek 52H/08NE	Li	4 292 232 tons @ avg. 1.06% Li_2O	Coniagas Resources Limited (CMH 2002-2003, p.109)	CMH 2002-2003, p.109	Inactive since 1957

Deposit Name and NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Nicopor 42D/14NW	Ni, Cu	185 000 T @ 0.48% Ni, 0.26% Cu (0-90 m); plus 190 000 T @ 0.40% Ni, 0.12% Cu (90-180 m)	B. Fowler and M. Shuman; Optioned to Novawest Resources Inc. (CMH 2002-2003, p.317)	Zenmac Metal Mines Ltd., Annual Report (1970)	Optioned to Novawest Resources Inc.; explored in 2001-2003
North Shores 42D/14SW	Au	Geological reserves of 2 Mt @ 2.2 gpt Au (Afric zone)	Autotrac Ltd.; currently optioned to International Taurus Resources Inc. (CMH 2002-2003, p.230)	Resident Geologist's Files	Explored in 1997 by Cyprus Canada Inc.; currently optioned to International Taurus Resources Inc.
Ontario Lithium (Jackpot) 42E/05SW	Li	1.18 MT @ 1.084% Li_2O	International Precious Metals Corporation (CMH 1997-1998, p.250) [company address and status unknown; CMH 2000-2001, p.220]	CMH 1997-98, p.250	Drilling in 1994
Pistol Lake 52B/09NW	Au	9.6 mt @ 1.4 g/t Au or 2.9 mt @ 2.6 g/t Au	D. Parker and B. D'Silva	GR in AF	Drilled by Detector Resources Ltd. 1994-1995
Powell 52B/07SW	Au	250 000 T @ 0.25 opT Au	Saganaga Resources	NM, Jan. 22, 1990	Milling bulk sample on site, 1992
Prairie Lake 42E/02SE	U, Nb, REE, wollastonite	200 000 T @ 1.8 lbs/T U_3O_8, 5.0 lbs/T Nb_2O_5	Nuinsco Resources Limited (CMH 2002-2003, p.319)	NM (03/05/79)	Prefeasibilty study on cement/lime products completed with positive results
Sapawe Mine 52B/14SW	Au	528 614 T @ 0.31 opT Au	Sapawe Gold Mines Ltd. (Resident Geologist's Files)	Sapawe Gold Mines Ltd., press release, March 10, 1995	Diamond drilling, 1995
Sawbill Lake 52B/14	Au	66 600 T @ 0.20 opT Au		OFR 5332, p.J-4 (1981)	
Schreiber–Pyramid 42D/14SE	Au	107 T @ 0.71 opT Au	B. Fowler (Resident Geologist's Files)	Resident Geologist's Files	Inactive; last worked in 1992
Silver Mountain 52A/04NW	Ag	60 000 T @ 5.0 opT Ag, 12% CaF_2		NM (28/10/54)	
Silver Islet 52A/07SW	Ag	115 000 T @ 40 opT Ag in dump[1], plus 300 000 oz Ag in roof pillar[2]; or 1 050 000 oz Ag[3], plus 750 000 oz Ag in pillars and stopes[4]	Cross estate (Resident Geologist's Files)	[1]MP 71, p.44 (1976) [2]MRC 10, p.74 (1968) [3]NM (18/10/79) [4]NM (10/02/83)	Dump material processed ca.1984 by QC Explorations Ltd.
Snodgrass Lake 52B/10SE	Au	60 mt @ 1.1 g/t Au; including measured and indicated resources of 475 000 t @ 6.2 g/t Au	Moss Lake Gold Mines Ltd. (CMH 2002-2003, p.283)	CMH 2002-2003, p.283; River Gold Mines Ltd., Annual Information Form, May 03, 2002	Drilling in 2003; seeking JV partner
Stewart–Fire Tower 52A/12SE	Au	60 000 t @ 3.0 g/t Au	M. Stewart; optioned to Valerie Gold Resources Ltd. in 2002 (CMH 2002-2003, p.431)	GR in AF	Currently being explored by ValGold Resources Ltd.
Sunbeam 52B/14	Au	4410 T @ 0.42 opT Au	[unknown]	OFR 5332, p.J-2 (1981)	Acquired by Allegheny Mines Ltd. in 1996 (company delisted 1999)

Deposit Name and NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Swamp River 52B/09SE	Au	998 000 T @ 0.12 opT Au (incl. 675 000 T @ 0.146 opT Au)	Band-Ore Resources Ltd. (CMH 2002-2003, p.52); optioned to Staccato Gold Resources Ltd.	CMH 2002-2003, p.52	Drilling in 2003 on main zone; Mag, EM, IP
Vanguard 52B/09NW	Cu, Zn, Au, Ag	East Vanguard: 100 000 T @ 1.8% Cu, 3.4% Zn, 0.22 opt Ag, 06 to 0.19 opT Au; West Vanguard: ~200 000 T @ 1.3% Cu, 1% to 2% Zn, 0.28 opT Ag	C. Bumbu, M. Fogen and J. Martin (Resident Geologist's Files)	News release, Allegheny Mines Corporation, Nov. 4, 1997	Optioned to Canadian Golden Dragon Resources Ltd. in 2002; diamond drilling in 2002-2003; VTEM in 2004
Vegan 42E/05SW	Li	750 000 T @ 1.38% Li_2O	Golden Nugget Exploration Inc. (CMH 2002-2003, p.190; Resident Geologist's Files)	NM (22/03/56)	Inactive
Willecho and Willroy 42F/04NW	Cu, Zn, Ag	759 448 T @ 4.42% Zn, 0.28% Cu, 1.47 opt Ag (combined)	Noranda Inc. (*The Chronicle-Journal* 25/10/98)	Willroy Mines Ltd., Annual Report (1976)	Past producers; last optioned/worked by Noranda Mining and Exploration Inc.
Winston Lake 42D/14NW	Cu, Zn	598 000 t @ 1.0% Cu, 21.2% Zn (incl. 33% dilution)	Inmet Mining Corporation	Inmet Mining Corporation, pers. comm., 1999	Mine closed, February 1999
Wisa Lake 52C/08NE	Li	330 000 T @ 1.15% Li_2O	P. Gagne (Resident Geologist's Files)	Manager's Report, Lexindin Gold Mines Ltd. (1958)	Diamond drilling, 1950s; staked in 2001 by current holder

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Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.

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